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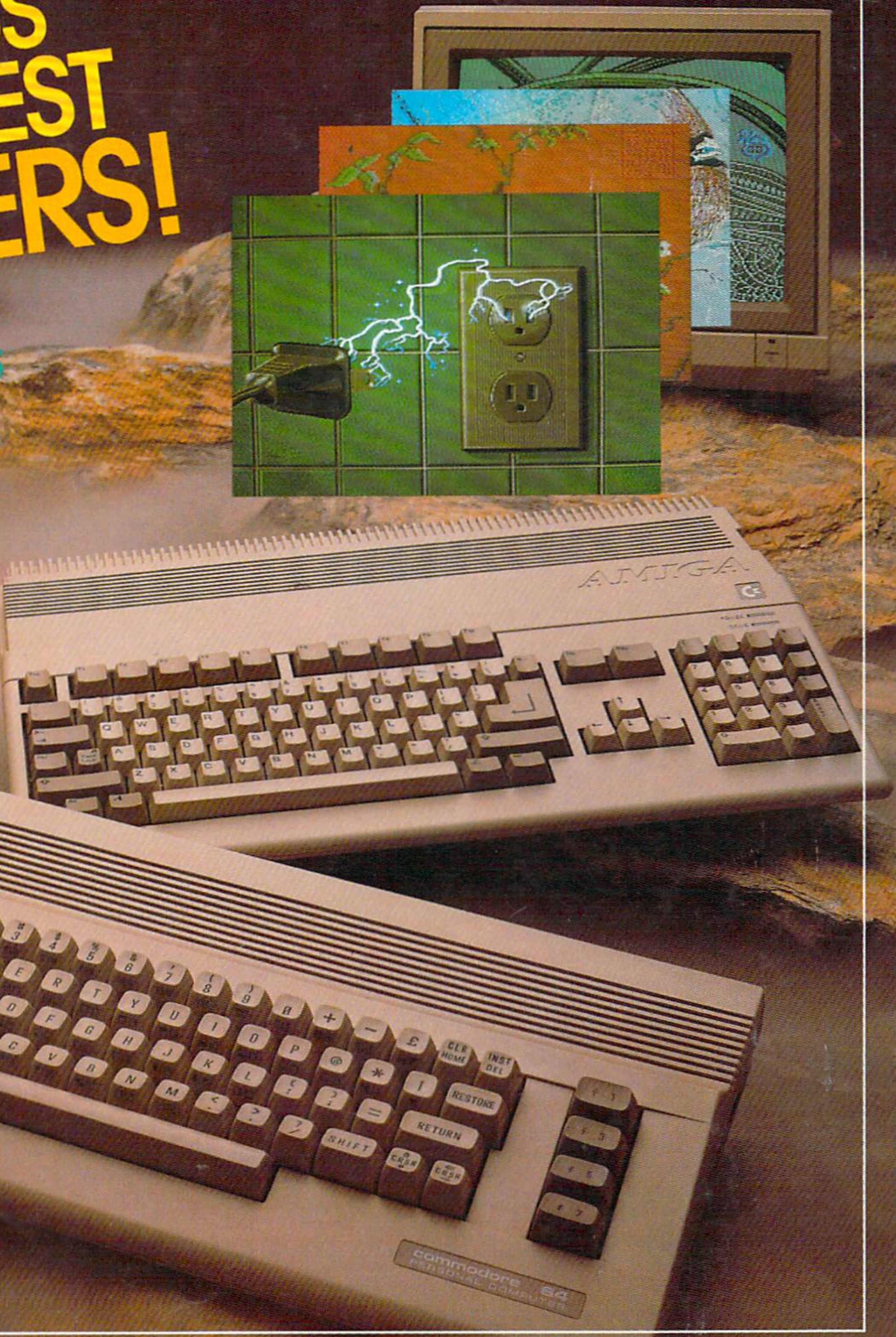
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MAGAZINE

June 1988
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Stealth aircraft . . . the hottest topic of discussion in aviation circles today. Space age technology and engineering make these aircraft virtually undetectable by enemy radar. Stealth fighters are believed to now be operating from top secret military bases, flown only on the most sensitive missions and only by the most experienced pilots.
Precise information about this next generation of Air Force jets is highly classified. But extensive research has enabled the aviation experts at MicroProse to incorporate the potential design and performance characteristics in a powerful new simulation.
Slip into the cockpit of PROJECT: STEALTH FIGHTER and familiarize yourself with the advanced "heads-up display" (HUD) and sophisticated 3-D out-the-cockpit view. At your disposal is a dazzling array of state-of-the-art electronics, weapons and countermeasures.
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JUNE 1988, *Volume 9, Number 6*



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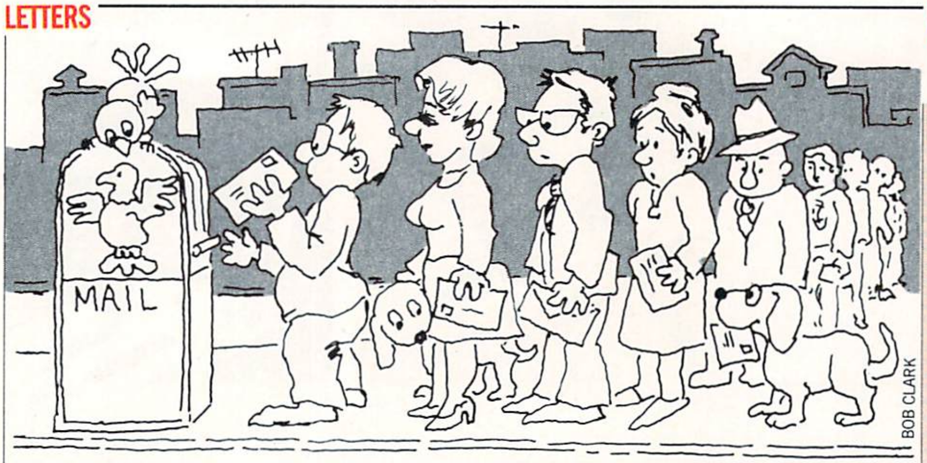
78

FEATURES

COVER STORY

Cover Photo: *Charles Bartholomew*

DEPARTMENTS



To the Editor:

I was much interested by "Mail Order Mania" in the February issue of *Commodore Magazine*, as I had just sent orders away. Here is my experience:

On January 25, I ordered an Icontroller, directly from Suncom. I received it February 16. Unhappily, something did not work in it, and I wrote to the company on February 18. By March 10 I had another Icontroller in my hand. Now, that is service with speed and honor—and across the border yet. I surely feel like dealing with these people again.

At the time of my original order (Jan. 25), I also sent an order to Lyco Computer. As of March 18, I still have yet to hear from them.

Buyer beware!

Sincerely,
Sam Coppieters
St-Alphonse-de-Granby, Quebec

To the Editor:

I have a friend who recently bought an Apple IIc computer. I have a Commodore 128. I am wondering if there is any way to connect our two computers by using modems between our houses. I am trying to find a way to do it without going through a BBS because of the prices. Could you please tell me what's needed?

Sincerely,
Adam Kurth
Sudbury, MA

Editor's Response: *All you need are modems and terminal software for the respective computers. Complete instructions come with the modems and software. Set both systems to the appropriate baud rates and protocols, then call your friend. Presto! You're online with no charges other than your phone bill. Of course, you'll only be able to exchange text, because the Apple IIc and Commodore 128 will not run each other's software. For more information on inexpensive telecommunications, see this month's feature "Getting Online Locally."*

To the Editor:

I just read [the review of] *FontMaster 128* by Scott A. May [*Commodore Magazine*, April 1988]. I agree that *FontMaster 128* is a pretty good word processor. As he says probably one of the best. But not absolutely the best. I think that overall *SuperScript 128* is better for word processing. It may not have as many fonts as *FontMaster*, but it has other features that make it more desirable. Of course, I have the Xetec Super Graphix Interface so I can load the fonts in it and have the best of both worlds.

First complaint: *FontMaster 128* does not preview in 80 columns, it previews in 53, a fact that Mr. May either overlooked or forgot to mention. I desire to be able to preview an article before I print it. You cannot do that in 53 columns.

Second complaint: When you pull a file up from a data disk and preview it, (in 53 columns) and decide to return to the edit mode by hitting RUN/STOP, the program will crash one out of three times if you have forgotten to replace the data disk with the program disk.

SuperScript 128 previews very well in 80 columns, and you can hit RUN/STOP and come out of preview mode into edit and make corrections, then just hit function key 6 and continue previewing where you left off. Also you have two work areas and can pull the file up in work area two after you have saved it and make sure that it is actually saved.

I have an Amiga 500 and *WordPerfect*, and I am still doing all my papers on the 128 with *SuperScript*. I am trying to make that quantum leap, but so far find myself using a word processor that I am more proficient with.

Sincerely,
Carl Poland
Virginia Beach, VA

Commodore MAGAZINE

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IT'S THE NEXT BEST THING TO SKIING THERE.

Or figure skating. Or cross-country skiing. Or even luging. In short, *The Games: Winter Edition* is one game that can bring you the thrills and glories of history-making athletic competition. It was designed with the help of former U.S. Olympic Team athletes. *And it's the only computer game to earn an official license from the 1988 U.S. Olympic Team.*



Behold the gates of glory. Now watch 'em whizz by.

Find out what it's like to be a human shock absorber in the Ski Jump. Double your blood pressure shooting down the chute in the Luge. Lean into a 30-mile-an-hour turn in Oval-Track Speed Skating. And then cross your threshold of pain in the Cross-Country event.

There are seven Herculean events in all. For one, two or up to eight players. With graphics so crisp and accurate you'll be tempted to bundle up.

Plus, thanks to the game's unique camera angles, you can view the Downhill and the Ski Jump events from the first-person or camera-angle points-of-view. One moment you're looking over your ski tips. And the next, you're watching your performance from the sidelines.



Just you and your shadow about to pull off a double-axle sit-spin.



Switch to the camera-angle point-of-view for a new perspective.

The Games: Winter Edition. Incredible graphics. Network-style camera angles. Excellent athlete control options. And opening and closing ceremonies modeled after those at Calgary.

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THE GAMES: WINTER EDITION

BY EPYX

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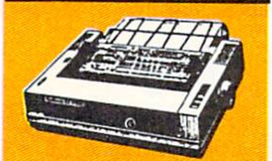
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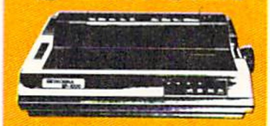
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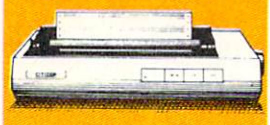
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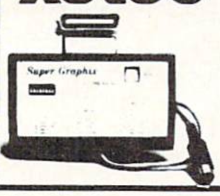
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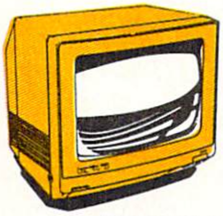
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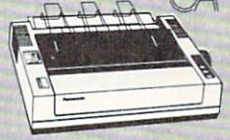
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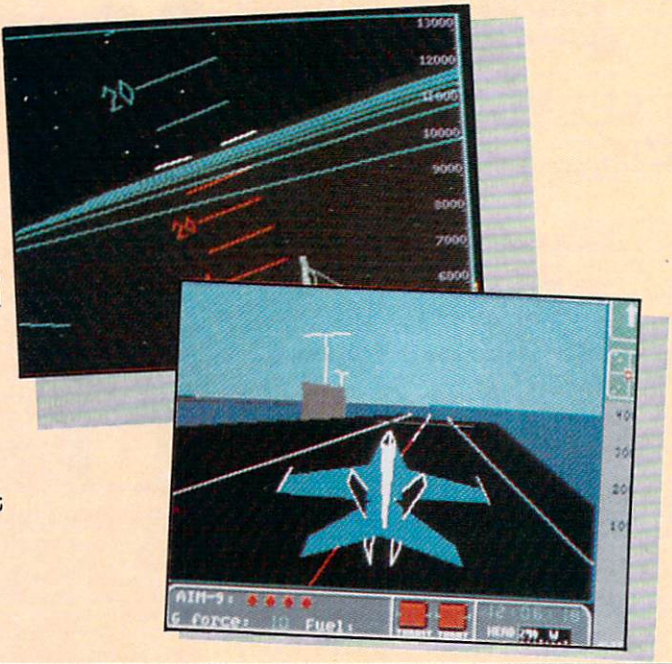
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688

Jet

SubLogic has released **Jet** for the Amiga. **Jet** allows you to fly an F-16 Fighting Falcon or a carrier-based F-18 Hornet in a variety of land/sea target strike scenarios. Combat ordnance, search radar, automatic tracking and an ejection seat are standard equipment. New features include a multi-player option that lets two players using separate computers dogfight with each other and a "missile's-eye view" feature that lets you ride your missile to the point of impact. **Jet** retails for $49.95. For details contact: SubLogic Corporation, 713 Edgebrook Dr., Champaign, IL 61820. Or call: (217) 359-8482.



BlackJack Academy

BlackJack Academy for the Commodore 64 is MicroIllusions' latest release. The program teaches you how to play blackjack with on-line help to explain play options and coach you on your best move. **BlackJack Academy** offers three different sets of rules from the major US casino cities: Las Vegas, Reno and Atlantic City. You also have the option of making your own rules. Suggested retail price is $39.95. For details contact: MicroIllusions, 17408 Chatsworth St., Granada Hills, CA 91344. Phone: (800) 522-2041.

Speaker-Sim

SpeakerSim from dissidents is a software package for the Amiga that assists sound engineers, audio professionals and musicians in the design of loudspeaker systems. The mouse-driven program includes parameters for over 100 popular loudspeakers. **SpeakerSim** retails for $112. A functional demo is available for $15 (credit towards purchase). For information contact: dissidents, 730 Dawes Ave., Utica, NY 13502. Or call: (315) 797-0343.

Video Title Shop Update

IntelliCreations, Inc. has repackaged the **Video Title Shop** to include **Graphics Companion I.** Formerly sold separately for $29.95 and $19.95, respectively, the new combination package will retail for $29.95. (See March 1988 issue of *Commodore Magazine* for complete product review.) For more information contact: IntelliCreations, 19808 Nordhoff Pl., Chatsworth, CA 91311. Or call: (818) 886-5922.

IntelliType

Electronic Arts has introduced an Amiga typing tutor for adults. **IntelliType** uses artificial intelligence along with a cliff-hanger adventure story to teach typing in one month. Daily lessons of approximately 45 minutes each are analyzed to diagnose unique habits of the user to prescribe special drills to address specific problems. **IntelliType** monitors 27 different kinds of typing errors in nine categories (e.g., trans-position errors, high keystroke speed variance, shifting with the wrong hand). The program retails for $49.95. For further information contact: Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. Or call: (415) 571-7171.

Time Bandit

In MicroDeal's latest Amiga release you are a **Time Bandit,** who must travel through time and space in search of treasure. There are 16 arcade land time zones each with 16 levels and 3000 screens to explore. Each Time incorporates a unique terrain with animated creatures. A two-player option accommodates both players at once on a split screen. **Time Bandit**'s suggested retail price is $39.95. For more details contact: MicroDeal, 576 S. Telegraph, Pontiac, MI 48053. Phone: (313) 334-3553.

Tisar 128

Tisar 128 is a database, invoicing and inventory control system for small businesses from CW Data-Labs. Designed for keeping track of point-of-entry invoices on a Commodore 128, the program runs in 80-column mode and can accommodate 500 customer records on each disk. The inventory control module stores information on up to 1000 current stock items. For further details contact: CW Data-Labs, P.O. Box 1401, Havertown, PA 19083. Or call: (215) 446-8890.

Free Spirit Adventures

Free Spirit Software, Inc. has released nine new text adventure games on three disks for the Commodore 64. The first disk, **Eye of the Inca** contains the title game along with **Shipwrecked, Son of Ali Baba** and **Perils of Darkest Africa.** In addition to the title game, **Revenge of the Moon Goddess** contains **Frankenstein's Legacy, Night of the Walking Dead** and **Sea Phantom. Eye of the Inca** and **Revenge of the Moon Goddess** retail for $19.95 each. **Three Hours to Live** is a new science fiction adventure, which retails for $9.95. For more information contact: Free Spirit Software, Inc., 905 W. Hillgrove, Suite 6, LaGrange, IL 60525. Phone: (312) 352-7323.

R & DL Graphics Tablets

R & DL Productions has introduced **AProDraw** and **AProCAD** graphics tablets to support freehand drawing on the Amiga. The tablets (developed by Summagraphics Corp.) are packaged with software that will work with mouse-driven, multitasking drawing, painting and drafting programs currently on the market for the Amiga. **AProDraw** includes a two-button stylus for operating Amiga software with one hand. **AProCAD** comes with a four-button cursor with cross-hair. Each is available with either a 12 × 12″ or 9 × 6″ active area. The 12 × 12″ **AProDraw** retails for $549, the 9 × 6″ **AProDraw** for $449; and the 12 × 12″ **AProCAD** retails for $599, the 9 × 6″ **AProCAD** for $499. For further information contact: R & DL Productions, 11-24 46th Ave. 2A, Long Island City, NY 11101. Phone: (718) 392-4090.

Fleet Check

Professional Software, Inc. has released **Fleet Check** a dictionary/thesaurus program for the Amiga. **Fleet Check** has the ability to check spelling as you type and will beep when a word not found in the 90,000-word dictionary is typed. Then a keystroke will reveal up to ten suggested alternate spellings. You can also access 10,000 synonyms and antonyms and add 10,000 of your own words to the dictionary. The program is compatible with most popular Amiga word processors and retails for $39.95. For details contact: Professional Software, Inc., 51 Fremont St., Needham, MA 02194. Phone: (617) 444-5224.

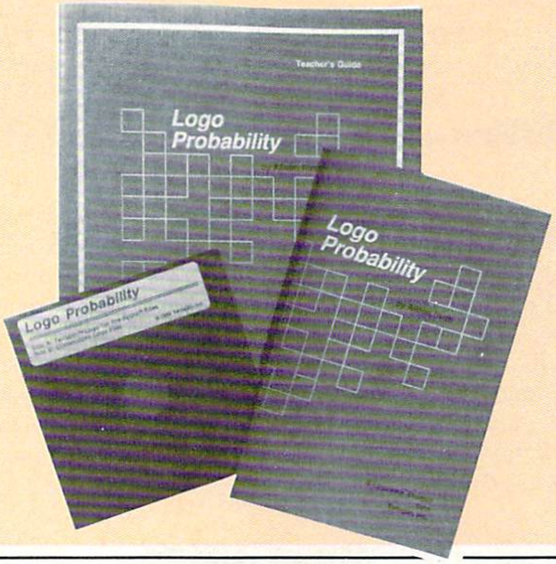
Stealth Mission

Stealth Mission, an arcade action flight simulator for the Commodore 64 from SubLogic, puts you at the controls of three different jets. You'll fly an F-19 Stealth fighter, an experimental forward-swept wing X-29 or a Navy F-14 Tomcat in eight different missions with ten skill levels. The simulator retails for $49.95. For details contact: SubLogic Corporation, 713 Edgebrook Dr., Champaign, IL 61820. Or call: (217) 359-8482.



Logo Probability

Terrapin, Inc. has released **Logo Probability,** which lets students explore probability predictions and hypotheses. The package comes complete with a Student Booklet, Teacher's Guide and Probability Disk to supplement curriculum and is designed to be used with popular middle school and high school mathematics texts. **Logo Probability** can be used with Commodore Logo on the Commodore 64. For further information contact: Terrapin, Inc., 376 Washington St., Malden, MA 02148. Phone: (617) 322-4800.



Musician's Music Software Catalog

Digital Arts & Technologies has released a new edition of the **Musician's Music Software Catalog** with over 80 pages of detailed information about music software products and MIDI interfaces available for all makes of microcomputers. Product types include: Educational Software, Patch and Waveform Editors, Pat Librarians, Sequencers, Transcribers, MIDI interfaces, SMPTE timecode hardware, books, cables and accessories. A two-year subscription to the catalog is available for $3 (refundable with first order). For information contact: Digital Arts & Technologies, Dept. CPR, P.O. Box 11, Milford, CT 06460. Or call: (203) 874-9080.

Mavis Beacon Teaches Typing

The Software Toolworks has released Commodore 64 and Amiga versions of **Mavis Beacon Teaches Typing.** The program's typing lessons incorporate riddles, rhymes, and jokes as well as "Tempo Typing" to a built-in metronome. On-screen graphics illustrate proper hand positioning. For the on-the-job typist, word processor (word wrap) and typewriter modes are available along with a resume writer. The Commodore 64 version has a suggested retail price of $39.95; the Amiga version sells for $49.95. For further information contact: The Software Toolworks, 13557 Ventura Blvd., Sherman Oaks, CA 91423. Phone: (818) 907-6789.

Impact Peripherals

Great Valley Products has released two new Amiga peripherals: the **Impact A2000-SCSI/RAM Hard Disk Controller** and the **Impact A500-HD/RAM subsystem.** The **Impact A2000-SCSI/RAM Hard Disk Controller** features a SCSI peripheral controller with 1MB Fast RAM on a single card. A socket is provided on the card for the 1.3 Kickstart ROM (when available) which will allow you to boot directly from your Amiga 2000's hard disk. The SCSI connector accommodates up to seven external SCSI devices. The unit retails for $495 (with 512K Fast RAM).

The **Impact A500-HD/RAM subsystem** provides a SCSI controller, 20MB hard drive and Fast RAM expansion capability for the Amiga 500. The plug-in module comes with its own power supply and will allow up to seven SCSI peripherals to be connected to an Amiga 500. The **A500-HD/RAM** has a socket for the 1.3 Kickstart ROM, and the internal expansion slot can also accommodate Autoboot/Fast RAM expansion cards. Suggested retail price is $995 (for ØK RAM). For more information contact: Great Valley Products, Inc., P.O. Box 391, Malvern, PA 19355. Phone: (800) 426-8957.

Easy Sign

Easy Sign is a Commodore 64 tutorial from Free Spirit Software on the deaf hand sign alphabet. **Easy Sign** teaches hand signing formations of alphabet, words and sentences and retails for $19.95. For more information contact: Free Spirit Software, Inc., 905 W. Hillgrove, Suite 6, LaGrange, IL 60525. Phone: (312) 352-7323.

Amiga Stores World Records

The Guiness World of Records Exhibition in New York's Empire State Building is using Amiga computers in an interactive sports information display. Digitized photos and animation illustrate over 2000 sports records in 40 athletic categories. The interactive display runs a continuous loop of sports history. Visitors press a key to activate a menu offering information on 16 major and 24 minor sports categories. When a category is selected, an animated screen displays records set in the chosen sport, and visitors can request more specifics on the category or a particular player's accomplishments. The Amiga will then display a color digitized photo of the winner or event and list details of the record held.

The Amiga displays are also used in Guiness' London exhibit.

Ed Gelb's Data Base

Ed Gelb's Data Base is a comprehensive listing of free access bulletin board system telephone numbers. The Data Base lists 10,000 BBS numbers in North America, Hawaii, Puerto Rico and the Virgin Islands. A high-speed retrieval system allows callers to download numbers for a heavily populated area code in an average of six minutes. Each listing includes the BBS location, baud rates, and time of operation. An annual subscription to the service costs $10 and entitles a member to 200 credit minutes. For more information contact: Ed Gelb's Data Base, 92 Hemlock Terrace, Wayne, NJ 07470. Phone: (201) 694-6835.



A500 Monitor Stand

The **MS-500** from Phoenix Electronics, Inc. is a monitor stand that fits in the groove of the Amiga 500 and is supported by legs in the back. The steel unit, which measures 18" wide × 16" deep, allows you to conceal cords underneath. The stand retails for $29.95 and will also work with Commodore 64 and 128 computers. For details contact: Phoenix Electronics, Inc., P.O. Box 156, Clay Center, KS 67432. Or call: (913) 632-2159.

Ticket to Washington, D.C.

Blue Lion Software has added another title to its line of travelogue software for the Commodore 64: **Ticket to Washington, D.C.** The program allows you to visit over 45 different sites from Arlington to Capitol Hill to Mount Vernon. In addition to sightseeing, you are encouraged to guess the identity of a famous American (past or present) by following up clues at the various locations. On-screen information and 3D maps assist you in your real-time search. **Ticket to Washington, D.C.** has a suggested retail price of $34.95. For further information contact: Blue Lion Software, 90 Sherman St., Cambridge, MA 02140. Or call: (617) 876-2500.

CALC Newsletter

The Computer-Assisted Learning Center has made their newsletter and library of public domain programs available on Q-Link. The group's monthly newsletter includes articles, software reviews, news and questions and answers concerning the educational uses of Commodore computers. An annual subscription to the **CALC Newsletter** can be obtained via Q-Link for $15. A hardcopy version is also available. For details contact: Computer-Assisted Learning Center, Middle Winchendon Rd., P.O. Box 132, Rindge, NH 03461. Phone: (603) 899-5209.

WHAT'S A TAITO?..



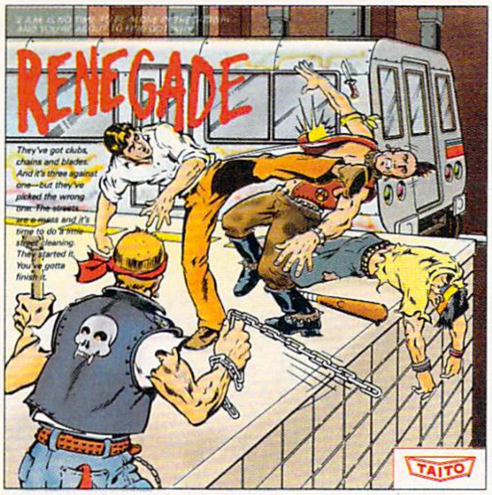
That's a very good question. Taito® (pronounced Tie-toe) is one of the oldest and biggest names in the arcade industry.

Taito is the world's largest manufacturer and operator of arcade games. We've been in the business since 1953.

And that's just the beginning. Taito practically started the video game industry with our classic arcade hit, Space Invaders.™ And over the years, Taito has created more than 1,000 other great action games for arcade and home play.



ARKANOID: 33 screens of space-age excitement. Award winning coin-op hit. Over 1 million sold in Japan. "One of the best ever."—Electronic Game Player Magazine.



RENEGADE: This is the one and only. Don't settle for imitations. Blistering, fast paced and real life street-style Karate action. One of the hottest games in Europe.

Now Taito has something equally exciting for you to slip into your home computer. Taito is bringing you the same pioneering spirit, technical quality and excitement that made us the arcade leader for play on your Commodore, Amiga, IBM, Apple and Atari computers.

We are the arcade leader for a very good reason. We consistently make great video games that bring more action and value to the people who play our games. And literally millions of people play our games in arcades all over the world.

Our strength comes from the massive development effort we put into creating the kind of games that satisfy the ever-growing arcade appetite and the research gathered from the more than 100,000 arcade machines Taito operates in Japan. (The money in the coin boxes at the end of the day tells very quickly if you've got a good game or not.) And Taito is always working hard to develop the most exciting new video



ALCON: The ultimate in inter-planetary combat. Battle aliens with lasers, homing missiles, bombs and shields. Fantastic vertical scrolling future-world landscapes.

games that push the technology to its limits.*

Because arcade games are the benchmark for home video games, Taito's leadership in the arcade translates into more home video thrills—more mesmerizing arcade quality graphics, sound and above all, action!

That's why nobody but Taito can bring you more of what you're looking for in home computer video games.



RASTAN: One of the biggest coin-op hits of 1987. Stunning graphics. Non-stop, mythical super hero action with multiple weapons, enemies and levels of play.

You don't get to be the biggest in the arcade business by developing and manufacturing run of the mill video games.



BUBBLE BOBBLE: Addictive action. Up to 100 levels of arcade quality play. One or two player action. The number one game in Europe for three months in a row.

When you buy Taito games, you're getting more than just fun. We bring you games that test your nerve and your strategy. Games that make you laugh and put you on the edge of your seat, games of adventure and excitement. Taito takes you on voyages to places you've never been before—to brave new worlds of imagination and fantasy. After all, isn't that what great video games are all about?

And every action game we put our name on is more than just competitive confrontation. Taito games are all about the values of good triumphing over evil, of being the best you can be—games like Arkanoid,™ Renegade,™ Alcon,™ Rastan,™ and Bubble Bobble.™ And we have more arcade blockbusters like Operation Wolf,™ Sky Shark,™ and Gladiator,™ coming soon to software formats for play on your home computer. Taito's home-bound hit parade of video fun has just begun.

Who but the arcade leader could bring you so much? That's Taito! Aren't you glad you asked?

Buy Taito products at leading computer stores everywhere. If no stores are near you, Visa/MasterCard holders can order anywhere in the U.S. by calling 1-800-663-8067.

TAITO®

*If you think you've got the technical and creative ability to develop mind-blowing video games, write to Taito, Attention: Product Development, at the above address.

Compiled by Louis F. Sander

Lou Sander's Tips & Tricks

Welcome, readers, to another month of fun and trickery. Starting off with a brilliant and seasonal Snader game, June's potpourri emphasizes math, printing and utilities, but other interests are well represented. (By the way, Bob and Dave are no relation to me—our last names are different, as all sharp-eyed Syntax Error finders are sure to have noticed by now.)

There's still plenty of time to enter our Programming Contest, announced in last month's issue. The rules in brief: Listings must fit on a single 40-column screen, including program name and your name in the first line; entries must be postmarked before July 1, and must include a non-returnable disk. Top winners get money, publication and fame. First prize is $100, with judging based on usefulness, beauty, craftsmanship, originality and general ingenuity.

Send your entries and your other Tips & Tricks to:
Louis F. Sander
P.O. Box 101011
Pittsburgh, PA 15237

Entries must be plainly marked "Programming Contest."

Lately, our mail has included thankful praise for the commercial game hints we've published, usually accompanied by pleas to keep on printing them. To feed your game-tips hunger, we've started another new column this month! Check out "Gold Mine"—we know you're going to like it.

Jaws LXIV: Here's a challenge for all you beach-loving game sharks. Run the accompanying 64 mode program, using the unshifted "greater than" and "less than" keys to move the little fishy. Your object is to make him intercept the bubbles rising from the skindivers at the bottom of the sea (off screen).

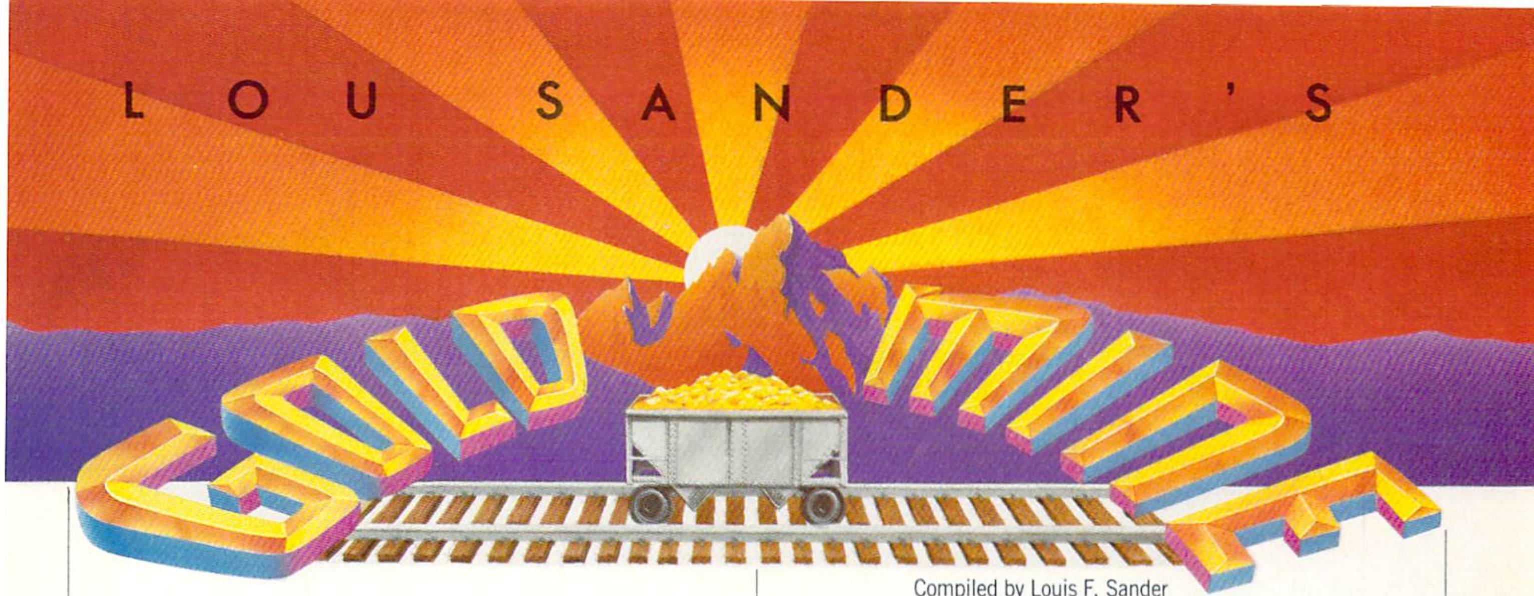
Each time Jaws misses a bubble, he moves downward on the screen, making it harder for him to succeed. The game ends when he drops out of sight. An on-screen clock lets you test your survival skills against those of your friends.

Just when you thought it was safe to go back into the water, there's Jaws LXIV!

Bob & David Snader
Baltimore, MD

```
100 PRINT"[CLEAR,WHITE]JAWS LXIV
    [GRAY3] - USE <&> - [YELLOW]
    BOB & DAVE SNADER":L=1104
    :POKE 53280,6
110 FOR J=832 TO 960:POKE J,0:NEXT
120 V=53248:S=54296:Y=70:TI$="000000"
130 FOR J=0 TO 33:READ Q,R
    :POKE 833+J,Q:POKE 897+J,R:NEXT
    :POKE V+21,1:POKE V+39,1:X=150
140 POKE L,32:POKE S,15:POKE S,0
    :L=1994+RND(8)*20:IF Y>250 THEN
    210
150 K=PEEK(197):M=M+(K=47):M=M-(K=44)
    :X=X+2*M:POKE 2040,14+(M<0)
160 IF X>255 THEN X=255:M=0
170 IF X<80 THEN X=80:M=0
180 POKE V,X:POKE V+1,Y:POKE L,32
    :POKE L-40,87:L=L-40
    :IF L<1100 THEN Y=Y+20:GOTO 140
190 IF PEEK(V+31)AND 1=1 THEN GOTO 140
200 PRINT"[HOME,DOWN,RIGHT2,L. GREEN]
    ";:PRINT MID$(TI$,3,2);"
    :";RIGHT$(TI$,2);"[L. BLUE]"
    :GOTO 150
210 PRINT"[WHITE]GAME OVER[L. BLUE]"
    :POKE 198,0:END
```

Continued on page 62



Compiled by Louis F. Sander

Take careful notice, dear reader—you're witnessing the birth of a legend. From this day forward, Louis F. Sander's "Gold Mine" will bring you the latest and best ways of scoring more points, reaching higher levels, and becoming Master of whatever Universes are worthy of your attention. We think you're going to love it.

No longer will game tips contend for space in the more practical "Tips & Tricks" column—you'll find those nuggets here, where they'll get the attention they deserve!

But a mine's a dangerous place, and since so many programs are involved, Gold Mine nuggets must be printed without extensive testing. So there's a chance, we hope a very small one, you'll find some pyrites among the gold.

If you have nuggets of your own to contribute, write them up and send them in. Successful contributors will get real and rewarding fame, plus a grubstake of $5 upward.

Each submission should combine all the tips for one game, and your name and full address must be printed on every sheet of paper. Mail your nuggets to:

The Gold Mine
P.O. Box 101011
Pittsburgh, PA 15237

From this day forward . . . **Gold Mine Rules!**

Aliens: Mission code 7040D starts you outside the Operations Room with four grenades. 7120E puts you in the air ducts while searching for Newt.
Hong Yu Tung
New York, NY

Archon: Play the dark side. If you can get the computer down to a couple of guys without losing any yourself, you can get an extra shapeshifter by having your Sorceress revive something.
Adam Larson
Anoka, MN

AutoDuel: This lets your character start off with more than $500,000. Create a new character and when the game starts, go to Joe's Bar. Even though you don't have a car, sell courier tasks (the garbled ones are best). If you can sell all of them, you can get anything you want.
Zi Wang
Kew Gardens, NY

The Bard's Tale I and II: If you're not advanced enough to have the Wizard Beyond Death spell and need to resurrect a character, cast the Animate the Dead spell at him, followed by the Dispossess spell. Now all you must do is restore his hit points. In *Bard's Tale II*, you must be in combat mode to do this wizardry.
Aaron R. Wishon
Desloge, MO

The Bard's Tale II: To find a Sword of Zar, teleport from the entry stairs of the Maze of Dread to 1 down, 15 north, 10 east. Tell the riddler "DER," which is "RED" spelled backwards. The sword can be thrown for about 300 points damage at a range of 80 feet.
Jeremy Hubble
Belton, TX

Breakthru: For unlimited cars, load the program and press your reset button. Then type:

```
POKE 6604,234 <RETURN>
POKE 6605,234 <RETURN>
POKE 6606,234 <RETURN>
SYS 12616 <RETURN> or SYS 2560 <RETURN>
```

Mystery Contributor
Adrian, MI

Bruce Lee: If you don't want the green Sumo to go after you, set the OPPONENT/COMPUTER key to Opponent. He won't come after you because you would have to maneuver him with joystick 2.
Nathan Jones
Baltimore, MD

California Games: In Foot Bag, use a straight kick (press fire when you are directly under the bag) to hit the sea gull. This gives you 1000 extra points.

To perform an Axel Folley, do any two kicks while pressing down three times or more in between. This gives you 750 points and a better variety bonus at the end.
Todd Major
Yonkers, NY

Continued on page 113

AMIGA Tips & Tricks

Compiled by Tim Jones

Each month in Amiga Tips and Tricks we offer tidbits, teasers or program examples. If you have an item you would like to submit for use, send it to:

> *Commodore Amiga Tips*
> *651 Outrigger Dr.*
> *Deltona, FL 32728*

If we use your tip or program example, we will pay you between $10 and $50.

This time around, let's take a look at some tips that have come in concerning non-programming hints for your Amiga's home.

Inexpensive 3.5-inch Disk Holder: If you are like most Amiga owners, your collection of 3.5-inch diskettes is mounting up quite rapidly. You've probably ducked into your nearby computer store in search of a disk holder to add some sort of order to your collection, only to find the price of such an item to be quite steep.

Well, there is a very inexpensive replacement for those expensive holders; it's called a recipe card file! Most discount stores offer them in many sizes and colors, and I was able to find one that would hold between 50 and 60 disks for $5.95 at a local Walmart store. It sure beats $39.95 for a disk holder that only holds 25 disks.
Sam Siragusa
Orange City, FL

[Now that I've invested over $100 in disk holders, Sam sends this one in!–taj]

Inexpensive Printer Stand: For those of you with limited desk space, you've probably noticed that your printer is a giant pain when it comes to doing a long printout. First, you have to find a place, usually on the floor under the desk, for your blank paper, and then you have to baby-sit the printed sheets to prevent them from being pulled back in as printing continues. Here's an idea that will keep your desk organized, yet not cost as much as some of those so-called "ergonomic" printer stands: use a desktop file. You know, the kind that you see on your boss' desk full of unprocessed requests for days off and the like. They can usually be had at a local business supply store for under five dollars.

I suggest that you get one of the high-impact plastic kind since it transfers less of the printer's noise into your desktop. Place the unit upside down on the desk with the opening towards the back and place your blank paper underneath. Now, you can allow your printouts to feed behind the printer and onto the floor without worrying about a mess and tangle of paper.
Jeff Jones
Roswell, GA

[I wouldn't suggest this if you have a 65+ pound Xerox/Diablo 630, but for most 10" carriage dot matrix units it should work great. While you're in the business supply store, look for this next item too.—taj]

Mouse Pads for cheap!: I have a very well oiled, real-wood desk, and my mouse's traction was less than acceptable. To make up for this, I was using a paper towel held down with drafting dots to increase the traction. A friend of mine dropped by and told me that she had solved her problem by purchasing a mouse mat at a local computer store. When I went to my local Amiga dealer, the pad that he tried to sell me was priced at $29.95 and was nothing more than a colored rubber pad with a cute little mouse in the lower-left corner. I took one look and decided no way! I can use a lot of paper towels before I spend that much.

One day while cleaning my office at work, I noticed that the rubber mat under my typewriter looked a lot like the mat that I had seen the previous week in the computer store. At lunch I headed out to a local office supply store to find myself one of these mats. I found exactly what I was looking for, and it only cost me $7.95 and ten minutes out of my lunch hour. Now, I use paper towels to clean up my coffee cup rings, and my mouse has a nice new rubber home.
Carol Sandersen
Peabody, MA

Screen Cleaner Woes: Having had my Amiga 1000 system since early in 1986 and living in a very dusty area, I have spent a lot of time "cleaning" the face of my Commodore 1080 monitor. The reason I put cleaning in quotes is because I was doing far more than that as I have recently discovered.

You see, it seems that the face of the CRT in the Amiga 1080 monitor is coated with an anti-glare finish which is soluble when attacked by ammonia. Well, for the past two years, I have been attacking my screen's coat with Windex ™ at least twice a week. After all this time, I've begun to notice that the lights in my bedroom tend to cause more glare on the screen than they should. I did some looking around and found that the new-found glare was caused by my cleaning ritual.

Continued on page 128



The third in our exciting series of rough, tough and gritty Street Sports™ games.

INTRODUCING STREET SPORTS™ SOCCER.



SPREET SPORTS SOCCER

Time to dust off every dirty trick you know. Shove. Pass. Dribble. Trip. Break all the rules for kicks.

Pick a team from a rakish roster of nine neighborhood kids who are anything but neighborly. They'll do anything to win. Forget fairness. This ain't croquet.

Play on a grassy, but slippery park. Or take your licks on a rough city street.

To score a goal, you'll need to pass, slice, hook, head (not to mention a timely trip or two), just to stay one step ahead of your opponents.

Street Sports Soccer. Band-Aids and knee pads not included.

BASEBALL HAS BEEN VERY, VERY GOOD TO US.

It's back. *Street Sports™ Baseball.* Our major league hit from last year.

There're makeshift diamonds. Bases made from spare tires. Trash cans to avoid. Bushes. Rocks. And chain-linked fences.

Those 16 cagey kids are also back. Each with his own unique style of pitching, hitting and fielding.



STREET SPORTS BASKETBALL

You pick the place. The players. The teams. The positions. The strategy. And then, you'll



CE FULL OF ASPHALT.

be right in the middle of it all. With a split-screen view from above and up close.



STREET SPORTS BASEBALL

Street Sports Baseball. It's the best seat in the house. Your house.

SO HAS BASKETBALL.

It's back, too. The same dingy alleys. Scruffy playgrounds. Dark parking lots. You'll pick three-on-a-side from the neighborhood's ten toughest players.

Hot shooters. Slow dribblers. They're all here. The one with the great hook. The one who shoves underneath. The one who tugs at jerseys.

Pass to the big man inside. Hit the guard coming across. Screen the lanky forward. Bounce the ball off the chainlink fence. But watch out for the oil slick. In *Street Sports™ Basketball,* anything can happen. And often does.

Street Sports Soccer. Street Sports Basketball. And *Street Sports Baseball.*

Take a walk on the wild side.



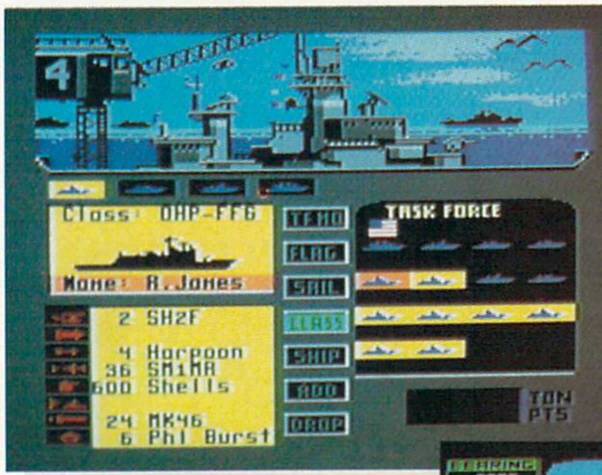
STREET SPORTS SERIES
BY EPYX®

Commodore 64/128, Apple II & compatibles, IBM & compatibles, Amiga

Reviewed by Steve King

Strike Fleet

Computer:	Commodore 64
Publisher:	Electronic Arts 1820 Gateway Drive San Mateo, CA 94404
Medium:	Disk
Price:	$29.95





What is particularly impressive is your ability to take control of each ship and helicopter in your fleet.

I could almost feel the cold, damp sea air on my face and hear the sound of the sea crashing against the bow of the warship. My thoughts were suddenly interrupted by the sound of the electronic warning system. I rushed to the bridge and grabbed my binoculars. My stomach tightened and I broke into a cold sweat—three enemy exocet missiles were bearing down on my ship at over 1500 mph. With no time to lose, I activated the computerized targeting system, locked on to each, and launched my defensive missiles. But was it too late?

This scenario is neither real life nor a dream, but a routine event in *Strike Fleet*, a naval combat simulation designed by Lucasfilm Games and distributed by Electronic Arts. *Strike Fleet* combines arcade-style action with tactical strategy and results in a truly impressive simulation where you can command an entire naval strike fleet.

Strike Fleet comes with ten different scenarios, ranging from commanding a single frigate stationed in the Persian Gulf (USS Stark) to commanding several British ships in the Falkland Islands conflict to commanding several task forces with sixteen different ships in an imaginary World War III mission. The primary object is not to blast away as many enemy targets as possible, but to complete the mission with the least amount of damage, utilizing the minimal number of ships. At the end of the scenario, you are evaluated and given a promotion if you did well or a court martial if you lost the fleet.

When the simulation begins, you are presented with the *Strike Fleet* Command screen. Here you scan the various missions (complete with small area maps and briefings) and select one or continue a previously saved mission. You can also embark on a Campaign which is a sequential series of missions. You then proceed to the Ship Yard screen where you review the ships in your fleet. Each ship has its own complement of weapons which can include cannons, helicopters, missiles and torpedoes. You also have the opportunity to substitute different types of ships, depending on how many available points you have for that particular scenario. Once you have selected your ships and designated one as your lead vessel, or flagship, you click on the sail button and start your mission.

You now move to the nerve center of *Strike Fleet* command—the Command Information Center (CIC). Most of the screen is comprised of a map of the area. You can zoom in and out to get a more tactical or strategic view. The CIC also displays fleet data such as speed, crew alert status and damage. From here, you can issue orders for the entire fleet. If you want, you can split your fleet into several separate task forces, each with its own flagship. By moving the cursor over the map, you can select your destination and turn on autopilot. You can even select a different flagship, or turn on your radar or sonar. One particularly handy feature is time compression which can speed up the game by a factor of up to 128. This is quite useful to allow you to get to a particular location quickly, or to pass time while waiting for an attack to occur.

Once you have launched your fleet, you finally move to the bridge of your flagship and join the action. The bridge screen is quite complex and requires you to master the keyboard commands to get from one section of the panel (or ship) to another fast enough to avoid destruction. It contains a propulsion control and navigation panel, weapons system controls, radar/sonar display, status indicators, and two visual window displays—one view is out the window and the other is through binoculars. Electronic Arts adds several realistic touches to the window views: the screen turns dark when night approaches, and a rocking motion of the ship is graphically achieved. What is particularly impressive about *Strike Fleet* and what really makes it different from most other combat simulations is your ability to move from and take control of each ship and helicopter in your fleet. As you do, the views and panel information change to reflect the condition and position of the vessel you selected. At any point you can take the helm by disengaging the ship's autopilot and steering manually.

Now you wait. Check your radar for enemy ships and planes. Check your sonar

for deadly submarines. Launch your helicopters to provide long-range intelligence. Wait for your Threat indicator to activate, warning you of incoming missiles.

Depending on the combat situation and the configuration of your ship, you have up to eight different weapons systems at your disposal. You can fire your cannons at enemy vessels (assuming you can get that close), or launch missiles to destroy them. Each type of missile has a different range, and each class of ship has different missiles. Therefore, it is vital to properly position your ships. If your target is a submarine, launch anti-submarine torpedoes, or better yet dispatch one of your helicopters to drop a bomb. Enemy targets appear both as blips on your radar/sonar screen and as images in your binoculars. As you cycle from target to target, the blips are bracketed and you see pictures of the target (which colorfully explode when hit). Cannon shells also splash in the water if you are off target.

The most dangerous and frustrating combat situation is defending your ships against out-of-range enemy aircraft and incoming missiles. There's no time to lose. Not only do you have to switch from ship to ship quickly to find the optimal defensive weapons available, but you also have to target the missile when it comes close enough. To make matters worse, multiple missiles can be coming at each of your ships simultaneously! You can view each of the missiles through the binocular portion of the screen as they approach, watching the range indicator getting lower and lower as the enemy missiles close in for the kill. When you launch defensive missiles, you can even target them and watch as they approach the enemy, rejoicing when an explosion destroys the target. But your missiles can also be destroyed, or miss, and as a last ditch effort against incoming missiles, you may have to manually fire your Phalanx System at point-blank range.

The most dangerous and frustrating combat situation is defending your ships against out-of-range enemy aircraft and incoming missiles.

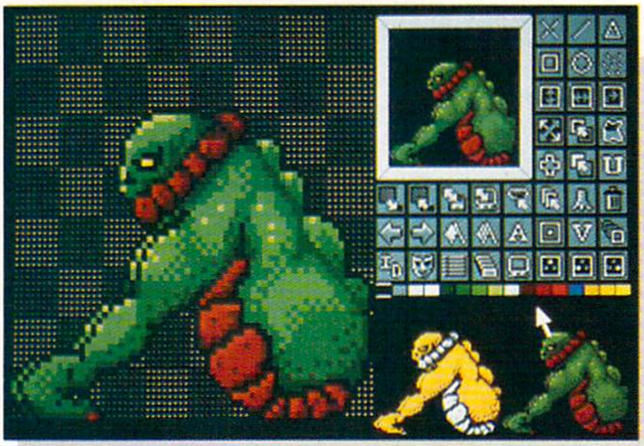
As your ship sustains damage, you may lose some of your vital electronic or weapons systems, making you much more vulnerable for destruction. But once you're out at sea, you're there until your fleet is destroyed (resulting in a court martial), you complete your mission, or the pre-established time period is up. There's no turning back! The simulation appears quite realistic, so much so that it sometimes becomes frustrating. If this is the case, stick to the simpler scenarios, have fun and move up when you are ready. *Strike Fleet* comes with a comprehensive 63-page Operations Manual. It succinctly describes the operation of the simulation, and provides history, data and illustrations of all of the ships, planes and missiles. Scattered liberally throughout the manual are playing tips, and the designer's notes at the end are invaluable. The entire simulation can be controlled by using either a joystick, keyboard commands or both.

Well, I suppose you are wondering how I did on my missions. To tell you the truth, I am writing this from the brig after being subject to multiple court martials. But *Strike Fleet* is fast-paced and exciting and, after all, practice makes perfect. I can't wait to get out to resume command of my *Strike Fleet*. ■

Reviewed by Scott A. May

Advanced OCP Art Studio

Computer: Commodore 64
Publisher: Rainbird Software
P.O. Box 2227
Menlo Park, CA 94026
Medium: Disk
Price: $29.95



The rescaling feature is a boon to creativity allowing you to enlarge, reduce, squash or stretch on-screen images.

There's a revolution of sorts going on inside your Commodore 64. A new wave of commercial software designers—largely independent of the major developers—has turned the graphics potential of the 64 upside-down.

Rainbird's *Advanced OCP Art Studio* is on the cutting edge of this new wave in graphics software. Its Amiga-like operating system—pop-up, pull-down menus—and multi-feature design make this the most professional graphics package you can buy for the 64.

Artistic talent is a difficult concept to define. People can be taught to construct perfect sentences, but that doesn't make them writers. Likewise, artistic technique can be learned, but rarely utilized without the inner vision of a true artist. The *Advanced Art Studio* isn't an art instruction program. It will not turn you into an artist. But it does supply the tools and techniques to unlock budding creativity.

The package actually contains *two* complete and self-contained programs on separate disks. The first is the original *OCP Art Studio,* produced by Oxford Computer Publishing (hence the initials OCP). Formerly available only in Great Britain, this program is hardly a throw back. Its features rival 16-bit technology, reducing previous efforts for the 64 in this genre to mere toys.

The second disk, *The Advanced OCP Art Studio,* contains many exciting new features and an improved, cleaner operating format. The design tools and techniques available on these disks are enough to make art instructors envious.

The main screen of each program contains two rows of pull-down command windows at the top of the screen. Users simply point and click at the desired menu and drag a cursor arrow to highlight each available option.

Both versions accept input from the keyboard, joystick, Koala Pad and the Datex mouse. Unfortuantely, there is no input driver included for Commodore's 1351 proportional mouse. *Advanced Art Studio* allows users to adjust mouse speed. Joystick users can easily switch to mouse mode and take advantage of this feature. Both programs feature digital readouts to compute precise X-Y coordinates of the cursor.

The File section of each program allows users to perform standard DOS functions, including the ability to merge two data files. Both disks support up to four disk drives.

The *OCP Art Studio* contains a menu option titled Attributes, which controls selection of ink, paper and border colors. This menu also allows users to set painting attributes to overwrite, inverse or transparent modes. Transparent setting turns off inverse and overwrite modes to mask what is currently on screen. This allows you to paint around a design without fear of changing its original design or color. The overwrite function is by far the most interesting, however. This mode combines new and old pixel images to simulate real oil-based painting. The effect—smearing electronic images to create unique textures—is incredible.

The *Advanced Art Studio* replaces the Attributes menu with one simply called Colors. Due to its advanced multi-color bit-mapped mode, individual cells—4x8 pixels in size—can contain as many as four different colors. To keep colors from bleeding, the Colors menu allows users to exclude and give priority to up to 15 colors. The exclusion procedure is similar to transparent mode mentioned earlier. Color priority permits users to fill in background areas without interfering with foreground colors. This adds depth to a picture, in effect placing one image in *front* of another.

The Paint menu for each disk offers nearly the same options: 16 pen points, eight random airbrush patterns, and 16 brush shapes (12 in the Advanced version). Although the original version allows you to edit only the brush shapes, the *Advanced Art Studio* also permits users to edit pen and spray patterns. The editing functions on both disks are comprehensive and easy to use.

The Window option contains a full-featured menu of exciting editing and special effects. You can define single or multiple windows, then rescale, clear, cut and

Continued on page 119

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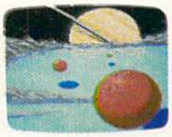
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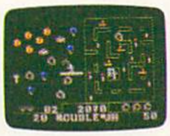
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Reviewed by Ian Adam

Halls of Montezuma



Computer: Commodore 64
Publisher: Strategic Studies Group
Distributor: Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
Medium: Disk
Price: $39.95

The Strategic Studies Group is rapidly developing a reputation as the producer of a unique brand of war games. Make no mistake about it—these are not video shoot-'em-ups! These are detailed computer re-creations of historical battles, with you at the helm of the simulated forces. *Halls of Montezuma* continues this tradition, offering a thorough range of scenarios constructed around the history of the United States Marine Corps.

Although the new game has several enhancements, the compatibility with earlier programs is sufficient that play is very similar. Even so, the experienced player would be well advised to read through the extensive manual in order to put the various scenarios and new features into perspective.

A new player entering the game faces a somewhat greater challenge before becoming a battle-ready general, however. You should allow several full evenings to learn the game. It is important to start by reading the manual, or at least most of its 100-plus pages.

So, if it's not a shootout, what *is Halls of Montezuma*? Each game is based on a scenario, a specific battle that lasts anywhere from a few to 25 simulated days. Each day is broken down into four moves representing the morning, noon, afternoon and night, to a maximum of 99 moves. You control the troops on one side of the battle; your opponent is either a second player or the computer. The game includes eight prepared scenarios, each based on a real historical battle. Playing out one scenario will take you from one to five hours.

With each move, you have the opportunity to review the progress of the battle and issue new orders to your troops. Your command will consist of three divisions; each division has a headquarters, up to four component regiments, four independent battalions and air support. Each regiment, in turn, will be composed of up to four battalions. Thus, in total, you could control as many as 60 battalions, three headquarters and air support. As you can imagine, controlling that much activity gets complicated, even though your control is at the regimental level.

The game is played out on a map composed of icons. There are icons for 16 different kinds of terrain, laid out on a hexagonal grid up to 39 wide by 28 deep. The efficiency with which troops move or fight depends on the type of terrain they are in, as well as on the nature and condition of the troops themselves. The proximity of enemy troops or installations also comes into play.

Overlaid on this scenery grid are 55 icons representing forts, mine fields, the troops themselves, etc. Each cell on the grid may have several icons associated with it; different icons are displayed, depending upon how the map is viewed. Certain strategic locations are identified as objectives; occupying these locations during designated turns earns you the victory points which are counted into your final score for the game.

Throughout the game, you play by making selections from menus, using the cursor keys to highlight your choice. It's just about impossible to enter information that is inappropriate to the program. The reports menus allow you to view the map, examine the status of your troops and review the objectives. When you have the information you need, move to the orders menus and give your troops their instructions. What you are able to tell them, of course, will be greatly influenced by the circumstances in which they find themselves.

While the menu system is great for convenience, there is a trade-off: You must flip back and forth through many menus and screens, about 50 in total. To help out the package includes several guides to indicate the structure of the menus.

Halls of Montezuma does not put you in the heat of battle, but rather allows you to exercise strategic power. This is achieved in your decisions as you issue orders to your troops, reassign objectives and redirect your assets. Sometimes, however, the orders you issue are not carried out as you intended. A battalion may get lost in a swamp, follow another regiment, or lose sight of its objective due to skirmishes with the enemy. This simulates the kind of communication difficulties between real-life commanders and their front-line troops. Troops who are lost or over-tired can not be expected to fight efficiently.

Documentation

Halls of Montezuma's packaging is very thorough and high quality. First, there is the manual with over 100 closely-printed pages of helpful information. (Fortunately this rather massive dose of martialism is lightened with an occasional touch of humor.) More than half of the manual is devoted to a comprehensive history of the USMC—required reading for any serious user. Many major battles are detailed, and eight are embellished as scenarios for the game. The descriptions of these scenarios

Continued on pg. 112



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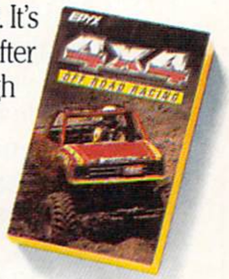
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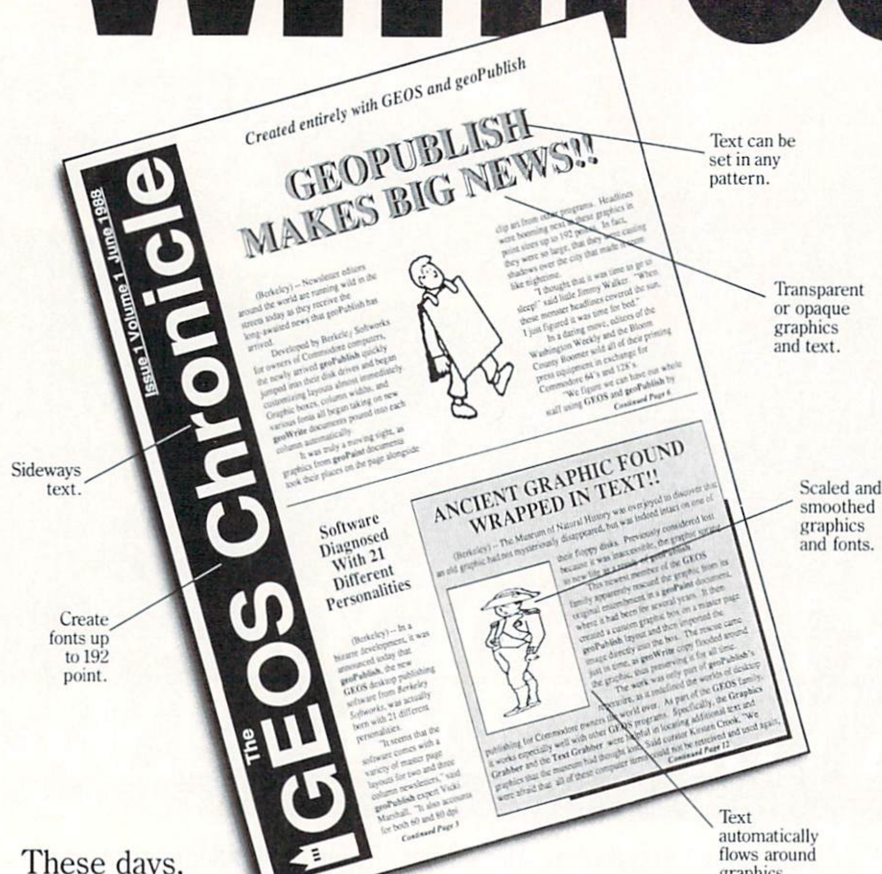
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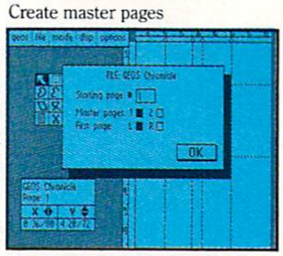
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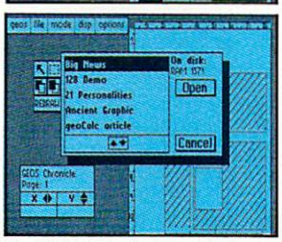


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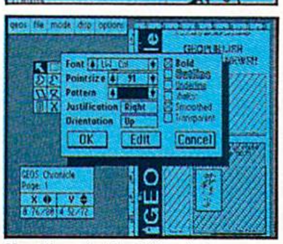


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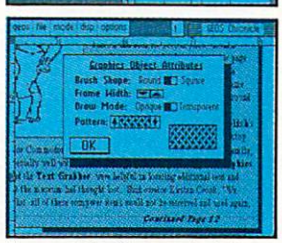




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Reviewed by Russ Ceccola

Realms of Darkness

Computer: Commodore 64
Publisher: Strategic Simulations, Inc.
1046 N. Rengstorff Ave.
Mountain View, CA
94043-9986
Medium: Disk
Price: $39.95

Realms of Darkness is an attempt by SSI to bring together the puzzles of text/text-and-graphics adventures and the characters, challenges and monsters of role-playing games. The result is a unique fantasy game that is extremely easy to play, yet challenges you to complete its scenarios, solve its puzzles and explore its limits.

Realms of Darkness relies heavily on its graphics to tell the tale of your explorations. All scenes are drawn from your party's perspective. An image of what you see is drawn on the screen in the towns and outdoors. In the dungeons and caverns the graphics are three-dimensional, reminiscent of graphics used for games such as *Bard's Tale* and *Legacy of the Ancients*. Graphics routines from *The Graphics Magician* by Polarware were used in *Realms of Darkness*; one look at any screen will cause instant recognition of their tell-tale style.

Realms of Darkness is played with menus, controlled by joystick or keyboard, and single keystrokes that correspond to approximately 25 commands. Movement is possible by pressing keys set aside for compass directions or using the joystick. I recommend using the keyboard for movement, because it is difficult to accurately move the joystick in the diagonal directions. It's easy to use the keyboard—save the joystick for the menus. Game play involves moving your party throughout the world on the disk, stopping to examine objects, solve puzzles, fight monsters and map your progress.

First you must create up to eight characters for your exploring party. You can also choose to use the characters already on the disk. They are inexperienced, but together they make a very good party. There are eight classes and four races for characters, as well as six attributes that govern how well a character does in the game. Create a character by responding to prompts from the computer to chose race, class, name, sex and attribute points. Points for attributes are chosen depending on the desired class. In any case, a party of eight should take no more than ten minutes to create. Your party doesn't have to have eight characters, but it's a good idea to use the maximum number. A word of advice—your party should be composed of four fighter types, two priests, one thief and one sorcerer for the greatest success.



One interesting feature of *Realms* is the ability to break up your main party into as many as eight smaller parties.

Two disks are included with *Realms of Darkness*, a Boot disk and a double-sided Adventure disk. All character creation takes place on the Boot disk; however, when the game starts, all of the characters in your party are transferred onto the Adventure disk. You save the game onto the Adventure disk as well. Never turn off the game before saving it, because all of the characters on the Adventure disk will be rendered useless. For this reason, I strongly recommend making a backup disk of your characters. An option from the Disk Utilities menu does just that. I accidentally blinded the characters included with the game when I turned off my computer. One of the great features of *Realms* is that you can save the game anywhere; make sure you do this often.

Most of *Realms* revolves around moving your party throughout the different towns, dungeons and landscapes. Because of the large size of the game and limited visibility in the dungeons, you have to map your travels. There are only a few commands that you have to use. They involve the manipulation of items, control of multiple parties, inspection of characters, movement and a few specialized functions. All are executed by pressing a single key, with a command card included in the package to assist your memory. In combat, all options are easily controlled from a menu that pops up on the screen when an opponent is encountered.

One interesting feature of *Realms* that will lessen the boredom factor is the ability to break up your main party into as many as eight smaller parties. This enables you to play in different areas with different characters in the same game. You switch parties every few turns. This feature adds greater playability to *Realms'* long list of fine points and offers a freshness of which other adventures can only dream.

The other half of *Realms* is referred to as "adventure mode." When you hit the RETURN key or the joystick button, a text window appears at the top of the screen. In it you enter commands for the character in the lead position to perform in solving puzzles as in traditional adventure games. There are things that can be done in adventure mode that can't be done in the role-playing/fantasy game mode and vice versa. In order to meet the challenges presented in *Realms*, you have to effectively use both modes. Generally, the role-playing/fantasy game mode is used for encounters, those things visible on the screen and the commands unique to that mode. Adventure mode is used for solving the puzzles of the game, performing actions not obvious from the graphics or command card, talking to characters, using items in special ways and investigating any special information that is given about a location.

Believe it or not, the goal of the game is not revealed in the manual beyond the fact that you have to explore the locations of the game, meeting all of the challenges along the way and completing seven scenarios. Only by exploration (or use of the Hint Book included in the package) do you find out what these seven quests are and where they take place. *Realms* starts

in the town of Grail, which has an Inn, Provisioner's Shop, Blacksmith, Tavern and Guardhouse. I'll tell you this much: speaking to the guard reveals your first quest—returning the sword Zabin to him by retrieving it from the dungeon in the Ruins. Other quests become more and more complicated and innovative and involve over 30 dungeon levels.

The different quests in *Realms* are well thought out and offer such goals as defeating a robot Gorth and finding the three shapes of power (cube, sphere and pyramid) which can be merged into a teleporter to travel to the next scenario. Interestingly enough, the scenarios must be performed linearly and some involve finding objects useful to the next scenario. I found the variation in scenarios, number of scenarios and the strong use of puzzle-solving skills to be a refreshing approach to the construction of a fantasy adventure game.

In most adventure games that use graphics, you have to wait a long time for a new image to pop up on the screen. I was greatly impressed with *Realms of Darkness*' ability to refresh new screens almost instantly. Keeping the player from being annoyed by play mechanics is one of the

Because of the inclusion of so many elements and the incredible ease of use, *Realms* is perfect for young or beginning adventurers.

things that designers must consider. Gary Smith and Duong Nghiem took this and many other fine points into consideration when designing *Realms*, for the fantasy game greatly caters to many comforts and conveniences for which adventurers have long yearned.

Also helpful to the player are the bonuses included in the package specifically designed to help in finishing the quests. Aside from the manual and disks, there is a Hint Book, incomplete Map of Outside/Map of Grail card, incomplete Map of Ruins/command card and Map Pouch (found in the playing of the game and not meant to be opened before then). All of the maps are clearly drawn, and the command card lists all keystrokes necessary in *Realms*. These beginner maps are meant to be just that. They are only a tiny fraction of the large picture and should be used as a guide to draw your own map. However, they will get you far enough into the game to get used to it and the things you will have to do.

The Hint Book gives answers for questions about the toughest puzzles in *Realms*, contains maps for all of the dungeons and outside areas and a list of all special magic items found in the game and their purposes. All of the other things in the package (including the Map Pouch) are meant to be used in completing the game; their use does not constitute "cheating." The Hint Book reveals everything about the game except the solution to the final scenario. Using it should be left to your conscience, as it *does* constitute "cheating" or, if you don't like that word, a firm nudge in the right direction.

I have to admit that I used the Hint Book in reviewing this game, but only for the maps. Why should I map out something that already exists within two feet of my hands? That attitude is the problem with using any hint book. I didn't look at the questions and answers until after I solved the puzzles and never looked at the Special Magic Items table. The Map Pouch includes the first levels for two dungeons in different scenarios, and it was pretty neat when I found the pouch while playing the game and was instructed to open it. Enclosures like this make the game more interesting.

After playing *Realms* with the Hint Book in hand, I realized that it actually was more difficult this way. If you're drawing a map as you travel, you always know what areas you've already explored. If you have the full map in front of you, you easily forget where you've been. I suggest you make your own map as you go along, but use the Hint Book as a guide to show you how much room to leave for future rooms and locations.

Realms of Darkness calls upon all of the skills that a well-rounded adventurer possesses. If you are only a seasoned role-playing game aficionado, you may have trouble with *Realms*. The same is true for those experienced only with text games. In both cases, *Realms* is perfect for developing your skills in another area while relying on abilities you already have. Because of the inclusion of so many elements and the incredible ease of use, *Realms* is perfect for young or beginning adventurers. The package boasts that it takes over 150 hours to complete the game. These may be the most enriching and mind-provoking hours an adventurer may spend in the coming months. ■

Reviewed by Mark Cotone

Label Maker

Computer: Commodore 64
Publisher: Cheatsheet Products
P.O. Box 111368
Pittsburgh, PA 15238
Medium: Disk
Price: $29.95

Label Maker even allows you to use information produced with your favorite word processor or data base.



When it comes to computer printing, sometimes the little jobs cause the biggest headaches. I'm sure that's old news for those of you who have ever clocked a few hair-pulling hours working on such small, irregular items as name tags, envelopes, file cards and the like. That back-and-forth exercise between the printer and keyboard—where you wrestle with your word processor in an attempt to correctly define margins, lines and spaces—probably tops may users' list of "Least Favorite Computer Chores."

Well, it's time to breathe easy, for help has arrived. In an effort to take all of the guesswork out of this tiresome hit or miss activity, Cheatsheet Products now presents *Label Maker*, a complete and thorough software package aimed at facilitating the production and printing of all those awkward and often frustrating little projects.

The emphasis of this program is on ease of use. Operations have been separated into three quick and simple steps aimed at breezing the user through this unique process in a matter of minutes.

First up is the selection phase, where you are asked to choose the specific size and type of label on which you would like to work. Twelve different styles are offered and listed down the right edge of the Main Menu screen. Along with the standard all-purpose label design, users can choose from such specialized items as shipping and ordering labels, name badges, rotary file cards, two envelope sizes and folder, cassette and disk labels. By any measure, it's quite a comprehensive assortment, sure to meet the needs of most home or office projects. In case you ever find yourself in a position where you are unsure of which label to use for a particular task, a visual representation of each design is offered as you move your cursor up and down the selection list. A quick check on the parameters and arrangement of all the possible styles should help you decide on the label best suited for the job.

After a specific label has been selected, a tap on the keyboard will initiate the construction phase, where the user is presented with a full-screen layout of his chosen design. The available work area is clearly outlined by colored groups of blank margined lines, whose number and width will leave no doubt as to the label's overall space restrictions. For example, in both of the envelope selections, two separate blocks of five lines are provided. These represent the usual areas reserved for the principle and return addresses. Simply type all of the particulars in their designated areas, without overstepping the preset bounds, and the program will take care of the rest, readying your information for printing by sliding the main address onto the envelope's center stage, and placing the return address in the upper-left corner. Fill it, lick it and stamp it and you're all set.

As far as inputing data goes, *Label Maker* has incorporated all of the necessary features to make typing and editing a snap. Aside from the more familiar options, like insert, delete, centering and justification, this program provides the user with a few special tools, like the ability to freeze characters, establish four digit increment fields, and access merge (fill) fields. This final feature actually allows you to take information from data files produced with your favorite word processor or data base, and create a sequential file to be used with this program. *Label Maker* has been designed to interface with almost all of the packages currently available on the market. Not only can it be used with many of the more popular names like *Fleet System*, *Easy Script*, *PaperClip*, *Super Base*, *Data Manager* and *Consultant*, to name a few, but it can also be used with *any* other word processor that can create a sequential file with lines ending in RETURN characters. That covers just about every professional package around. Just think of how easy it will be to address all of those holiday cards.

When you're finished constructing a label, it's time to move to the printing stage, where you're sure to find *Label Maker* most accommodating. Using a simple menu-driven guide, labels can be printed in lots ranging from a single copy to a load of 999. There's an advanced feature, which lets you bring a blank label forward; a pause control, which allows you to stop and restart operations with a tap of the space bar; and a "test print" feature, which will be most appreciated when it comes time to line up the first label. And in an area directly linked to this printing phase, this package is also equipped with an added bonus without which most jobs really wouldn't be complete. *Label Maker* comes with . . . labels! And lots of them. In fact, there are over five hundred here, enough to make a sizeable dent in even the most ambitious project. And in the event that your inventory oes become depleted, Cheatsheet Products will be more than happy to supply you with whatever replacement labels you need—for a nominal fee, of course.

If you like your programs user friendly, you're going to love *Label Maker*. The instruction booklet is concise and complete, leading you through operations with fluid, easy to follow directions. And once you've loaded the program, you won't even have to refer back to the documentation for assistance. Three different review charts, covering cursor movement, editing and printing, are waiting in the monitor's wings to pop on screen in your time of need.

Are your floppy disks still anonymously lying about in an unlabeled stack? Is your Rolodex screaming for a major overhaul? And what about those audio cassettes you've been promising to organize since last summer? It's time to tackle those tasks without apprehension. Thanks to Cheatsheet Products, working with labels no longer has to be a sticky situation. ■

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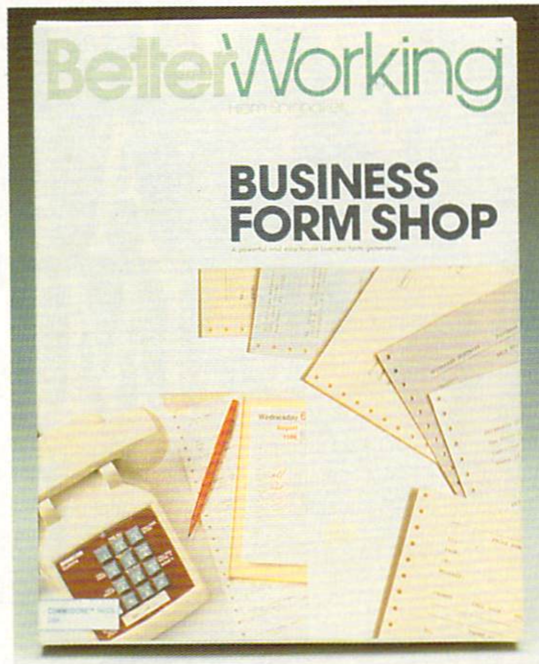
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Reviewed by Gary V. Fields

Business Form Shop

Computer: Commodore 64 or 128 (40/80 column display)
Publisher: BetterWorking From Spinnaker
One Kendall Square
Cambridge, MA 02139
Medium: Disk
Price: $39.95



The real power of the program is that it will automatically calculate any math required to complete a form.

The title, *Business Form Shop*, labels this productivity program perfectly—it is a business product for the business world. Home users may find some applications for the program, but it is the business user who will benefit most from this unique and powerful program.

The program lets you design, and then fill in and print any business form you might need. The restrictions on what forms it can create are unlimited. It can be used to print invoices, expense accounts, W-2 forms, reports, financial statements, inventories, or any other paper-based form. The single program disk contains both a 64 (40-column display) and 128 (80-column display) version of *Business Form Shop*, and the program is not copy protected, so the business user never needs to worry about being without the use of this tool.

The program not only generates business forms, but also allows the user to fill them out on screen and then store both the form (template) and data to disk or print the completed forms, using a matrix printer. Because each form can be as brief as a single page or as lengthy as 100 pages, *Business Form Shop* should be sufficient for any application.

The real power of the program is that it will automatically calculate any math required to complete a form. You determine the complexity of these math activities when you design the form. If you wish, the program will do things as simple as keeping a running total of numbers. But if you wish, it can calculate sales tax, inventory discounts or markups, sales commissions or anything that you would normally do manually. In short, the program uses the computer for what it was intended to be—a true business tool. I suspect many of you are yawning now, but those who use their 64 or 128 in business should be wide awake and eager to read on, after those hints of the program's potential.

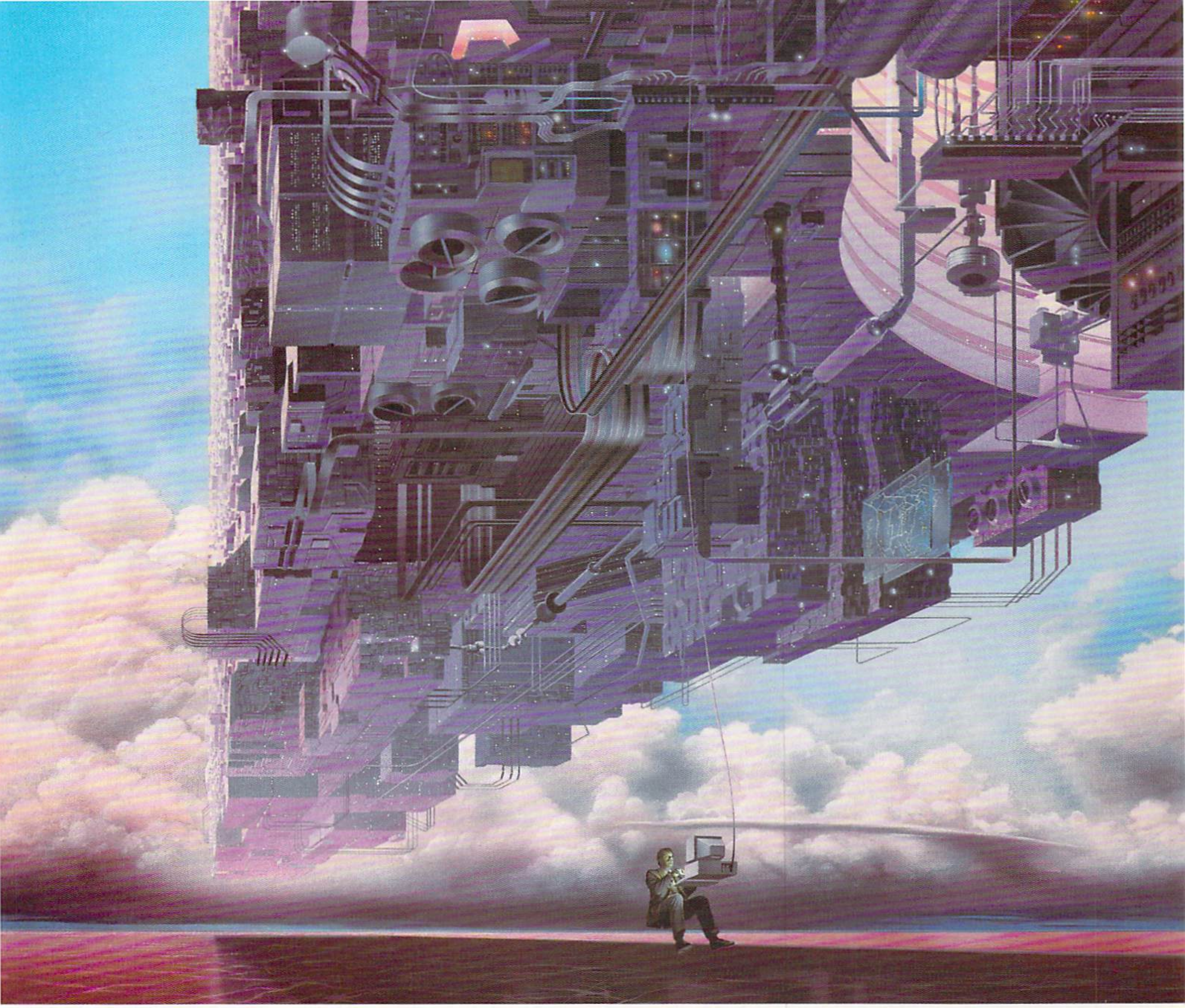
What makes computers so wonderful is their ability to take the drudgery out of routine jobs. Every business person in the world is familiar with the famous "paper shuffle" which, although time consuming and boring, is necessary to keep businesses and the world's economy running. While *Business Form Shop* does not eliminate the drudgery, it minimizes the task, and more importantly, ensures that the bottom line on each form is accurate.

Here's how *Business Form Shop* lends a helping hand. The program divides activities into either creating a custom (template) form or filling in the finished form. You can learn to do both quickly, since the program comes with several pre-designed templates, and the 52-page manual is complete with a tutorial.

The toughest part of using *Business Form Shop* is visualizing the form you need to create. I find sketching the form on paper first helps. You should remember to include a record number on each, addresses, directions (ship to, due dates, etc.), and then divide the form into organized columns of data (quantity, ID numbers, description, price, etc.). If you are already buying commercial forms which contain the information you need, you can use one as a guide. Simple pull-down menus let you design and change a form quickly.

Anyone who has ever used a spreadsheet will feel very comfortable with *Business Form Shop*. All formulas for math operations are input using spreadsheet notation. For example, to add two columns on the form, you identify those areas as you would a cell in a spreadsheet specifying which row and column to act upon. The beauty of creating your own forms is that you can change them easily as your needs change. Anyone who has ever paid a hefty price to have a commercial printer produce custom forms only to realize some important detail has been left off the form will love the ease with which such mistakes can be corrected here—at no cost.

Once the form is complete, you simply call it up, respond to the screen prompts for data and either save the completed form to disk or dump it to a printer (in triplicate if need be). The result is a professional-looking, complete form. If you've ever battled with a traditional form and printer, trying to get the output to print on the correct line, you'll fall in love with this easy-to-use program. ■



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Reviewed by Graham Kinsey

King of Chicago

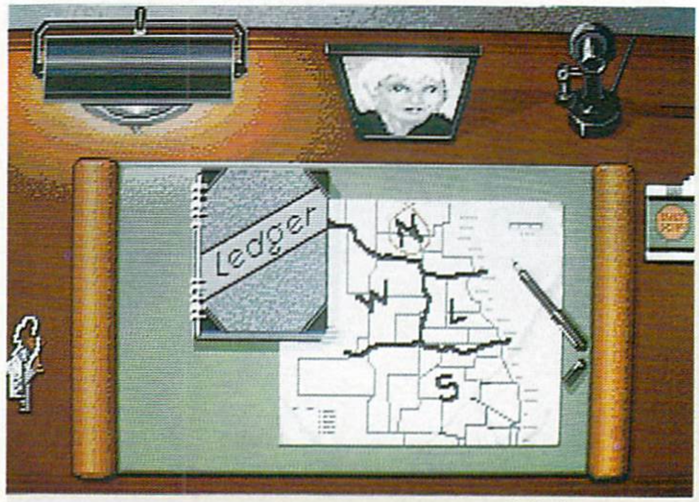
Computer: Amiga
Publisher: Cinemaware
4165 Thousand Oaks Blvd.
Westlake Village, CA 91362
Price: $49.95

The Cinemaware line of entertainment software that simulates the look and feel of an interactive movie, has made a big impact on the Amiga software scene with titles like *Defender of the Crown*. Cinemaware is back with another new release for the Amiga. *King of Chicago* is based on the popular 1930s gangster movies theme. In this game you play the part of Pinky Callahan, an ambitious gangster who wants to take advantage of Al Capone's recent departure to Alcatraz by rolling over Al's hoods to become the new "King of Chicago."

As you begin you find that Pinky must first do a little "house cleaning" in his own Northside gang. The Old Man who is presently running the gang has been kicked around like an old dog by Capone and is now just a fragile shell of what he once was. Pinky knows the Old Man can't maintain respect among his own gang members now, much less among his enemies. Once you have "persuaded" the Old Man to step down, you must then deal with Ben, the Old Man's right hand man whom you must befriend in order to assume full control of the gang.

Once you have taken care of internal affairs, you can start on your quest to claim each and every piece of Chicago as your own. Chicago is split up into four different territories: the North, the West, the Loop and the South. At the start of the game you control the North territory, and the other three are controlled either directly or indirectly by Capone's Southside mugs, now led by the ruthless Tony Santucci. Your ultimate goal is to obtain control of all four territories within three years.

You regularly appear at your desk, where you make most of your decisions. On your desk is the Northside gang's ledger, which outlines the total financial picture of the Northside gang. All income sources and expenditures are viewable, as well as the net loss/gain for the month and how much money the gang has put aside for a "rainy day." In this mode, you can choose whether to try to force more income from each of your three sources (speaks, gambling and rackets) or stand pat with the current amount of money coming in from each source. You can also adjust the monthly salaries for yourself, your girlfriend Lola (more on her later), and Ben. You can vary how much money the gang pays in bribes to various parties each month. You can also decide whether to hire more gang members or fire some of the ones you already have, and you can adjust how much each mug gets paid.



You have to deal with crooked politicians, do-gooder policeman, unsympathetic voters, gang members and your mother.

In addition to the ledger, there is also a map of Chicago in front of you. The map serves as a quick reminder of which of the four territories you currently control. If you click on the map with the mouse pointer, Ben will come into the room and you can discuss strategy with him.

Your other option from the desk view is to visit Lola, your feisty girlfriend. Lola will always complain that she doesn't have enough material possessions. If you go out of your way to satisfy her, the Northside gang members may perceive you as being spineless and opt for a more forceful leader. However, if you make her unhappy by never giving in to her, she might leave you for Tony Santucci, which could lead to a severe loss of respect by all concerned. Either extreme can be fatal. But Lola isn't the only problem you have.

Santucci won't stay idle while you try to muscle in on his territory. Tony has a soft spot for hit men, and you will always have to be on guard just in case someone is waiting to deliver an unwanted present at your office. You also have to deal with the likes of crooked politicians, do-gooder policeman, unsympathetic voters, your own gang members, and—last but not least—your mother, who is broken-hearted because of the profession you have chosen.

When a choice confronts Pinky in *King of Chicago*, you will see different "thought balloons" appear each with different actions inside. You can then click on one of the balloons to tell Pinky which decision to make. Think carefully, since once you have made a decision, you may feel its effects for months to come (or forever, if it leads to the grave!). But don't just sit still, for if you don't make a decision Pinky will eventually decide on his own, and you may not like the choice he makes. Naturally the other characters present will react to the decision you make.

In addition to dealing with numerous characters correctly, making smart decisions and juggling financial matters, you must also master the most basic part of being a gangster—killing people. In *King of Chicago* you usually have two weapons with which to work: the bomb and the submachine gun. Whenever you go on a raid, you will get to choose which form of attack to use.

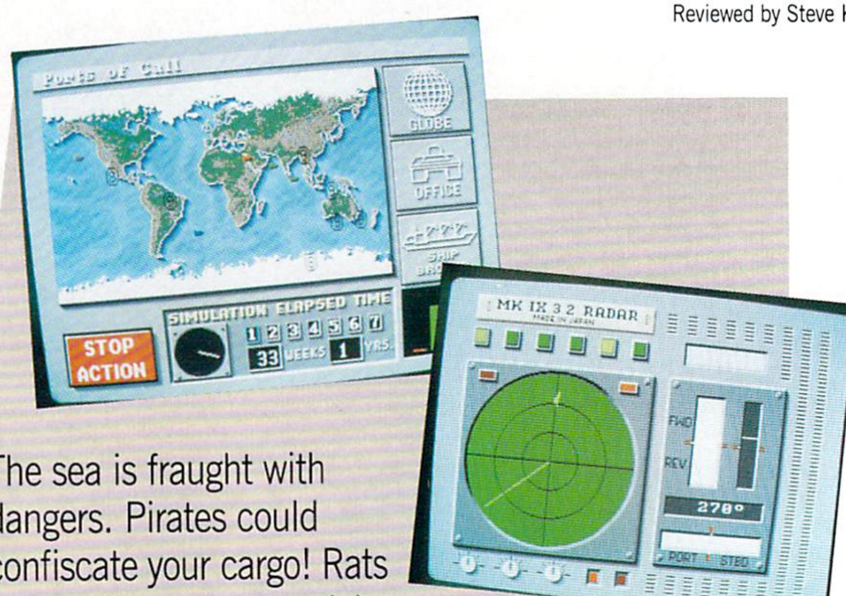
The sub-machine gun is the more conservative weapon. When on a raid with a sub-machine gun, your gang pulls up in front of the targeted building. Then you get to control your sub-machine gun, trying to blow away any enemy mugs who appear in the second story windows or on the street below before they can get a shot off. If they do shoot first, then one of your gang members will be killed. If enemy fire wipes out all of your gang members before the battle is over, then it's you against the

Continued on page 111

Reviewed by Steve King

Ports of Call

Computer: Amiga
Publisher: Aegis Development, Inc.
2210 Wilshire Blvd.
Suite 277
Santa Monica, CA 90403
Price: $49.95



The sea is fraught with dangers. Pirates could confiscate your cargo! Rats on board could cause delays and subject you to fines!

The moment I saw the title screen appear I knew I was in for a special treat. With the mountains in the background, the cargo steamer "Aegis" sat in port spewing water from its bilge pump into the rippling water. I was surrounded by the sounds of the harbor—the sea gulls, the ships' horns, the clatter of machinery. Then slowly and smoothly, a crane lowered a crate, its shadow growing on the dock. The crate hit the pier with a thump. Stencilled on it were the words "Ports of Call."

Ports of Call is a cargo shipping simulation and Aegis Development's first attempt at "interactive entertainment software." The premise of the simulation is simple: you and up to three other players start out with $5,000,000 to form shipping companies, buy ships and sail the world with the most profitable cargo you can find. This simulation is highly entertaining and liberally sprinkled with arcade-type action.

The first order of the day is to set the length, difficulty level and number of players. Then you name your company and select your home port from a list of 28 ports located all over the world. After that, the World Simulation Display appears. Most of the screen is taken up by a colorful world map with a raised look. The bottom of the screen displays a button to start and stop the game; it also displays the time elapsed. There are three squares to the right of the map labelled Globe, Office and Ship Broker.

Click on the Ship Broker so you can buy your first vessel. In a moment, another screen appears depicting a street view of the Broker's brick building. You peer in through the front door and see an elevator at the back. The elevator hums and the floor indicator lights above the elevator blink. The doors roll open and you are shown an elevator panel with five floors. The top floor sells high tech ships costing upwards of $65 million—far too expensive for novices like us. The third floor sells klunkers—very cheap, but you get what you pay for. The fourth floor sells preowned vessels costing $4-5 million—just what I wanted since I only had to put 50% down and could mortgage the rest. On each floor detailed pictures of the ships are displayed along with vital information about the ship, including maximum speed, fuel use and daily operating costs. When you purchase a ship, note this information, particularly operating costs, as you will need it later on. You can go to the second floor to sell your ships.

Before sailing you had better visit your office where you can obtain information on your assets and accounts, as well as borrow money or pay off mortgages and loans. Be forewarned, however, that if you don't visit your office frequently, you will be advised that one of your unscrupulous employees has dipped into the till and absconded with several hundred thousand dollars.

After visiting your office or the Ship Broker, you will be returned to the World Simulation Display where your ship is shown as a small colored line at your home port. Whenever some event or action is about to occur, your ship will blink rapidly. At this point the Port Display screen appears depicting the captain's cabin where you look out the porthole at the skyline of the port city. Each port has a different view, each quite meticulously drawn. Below the porthole is a blackboard with facts on the country you are in. On the top left of the screen is a piece of paper tacked to a sheet of pegboard. This displays the data on your finances, ship condition and fuel level. Below this is a clipboard containing Captain's Orders, in a menu format. Here you can choose to repair, refuel, charter your ship, lay up for a while, or load your cargo and sail.

If you choose to repair your ship, you are shown a screen with a picture of a ship in dry dock. You select how many percentage points you want your ship repaired after reviewing the cost for each point of repair. The most important choice, however, is the Charter screen where you will see the various cargos and destinations available. Any combination of cargo and port will give you a different charter rate. For example, while carrying agricultural products to a nearby port may only bring in $100,000, an arms shipment to the Middle East could easily be worth several million. Most shipments have no time limit for delivery. Those that do are worth more but carry a daily penalty for each day the delivery is late. From my experience, it is rare not to incur some penalty, no matter how fast you go. If the available cargo isn't profitable, you can choose to lay up, hoping for more profitable cargo in the future. If things do not improve, you may be forced to carry ballast (at no revenue) to another port after incurring your fixed operating costs for several days while you waited.

Once you have selected your cargo (and know the distance to your destination), you can return to the Port Display (which

shows how much fuel you have) and decide whether you need to buy fuel for your voyage. If you do, another screen appears showing your fuel bunker. You can click on one of several buttons to fill up to a desired percentage level. The price of fuel varies greatly from port to port. Sometimes it only costs $60/ton, but other times it can rise to over $190/ton. It is wise to fill 'er up when fuel is cheap, and buy only what you need when fuel is expensive. If you run out of fuel, there always seems to be a friendly ship around to bail you out for a measly million or so!

Some ports are easy to navigate, while others remind you of the most nightmarish miniature golf course hole you have ever seen.

Now that you have enough fuel, have repaired your ship (keep it up to 80%) and have chosen your cargo, it's time to load up. At this point, you can select your cruising speed by pointing the mouse at a slider bar to pull it up or down. As you move it, your speed will change and so will a display indicating your daily fuel consumption and the estimated length of your voyage. The slower the speed, the less fuel consumed and the longer the trip. You can determine your profit by calculating your daily fixed costs and the cost of fuel, and then subtracting this from your charter fee.

Once you have set your speed, you're ready to sail. You are now asked whether you want to pay to have the tugs tow your ship out of the harbor, or steer it yourself at no cost. If you elect to steer by hand, the fun begins. You are shown a detailed aerial view of the harbor (complete with buildings, cars, cranes and rippling water) with your ship dockside. The object is to maneuver your ship away from the dock and out of the harbor through a white box on the left of the screen. On the lower-right corner is a Navigation Control Panel containing a speed control for forward and reverse, as well as a rudder control. The most expensive ships also have a Transverse Thruster which enables you to move sideways. Using the mouse to manipulate the controls, you move your ship backwards and forwards around piers obstructing your way until you are out of the harbor. Some ports such as Monrovia, Liberia are easy to navigate, while others, such as Basrah, remind you of the most nightmarish miniature golf course hole you have ever seen. If you happen to hit the dock, you will be towed away at a cost far exceeding the original cost of tugboat service. During this maneuver a small hourglass loses sand. If you're not finished in time, you are escorted out (for a fee, of course).

After you become a seasoned captain, you will begin to remember which ports require a tug escort, although the docking position of your ship changes from visit to visit. In case you think you can totally avoid this part of the game by always selecting the tugboat option, you can't. Quite often the tugs are on strike and you must steer by hand.

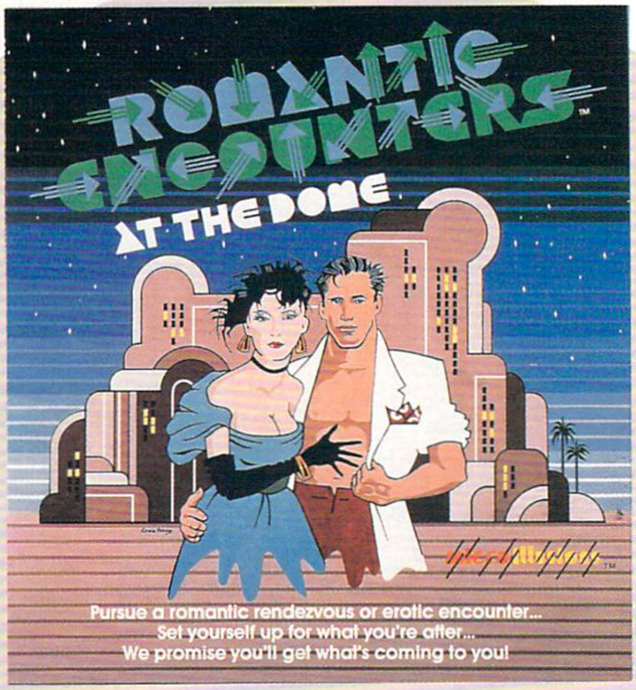
Once at sea, the World Simulation Display appears again, and your ship is off on its journey. You can click on the Globe button to display a solid globe which graphically indicates your route and your position. A nice feature allows you to move a coordinate gadget with your mouse to rotate the globe on any of its three axes, quickly displaying the globe and your route from any perspective. As

Continued on page 86

Reviewed by Tim Jones

Romantic Encounters at the Dome

Computer: Amiga
Publisher: MicroIllusions
17408 Chatsworth St.
Granada Hills, CA 91344
Price: $39.95



From getting drunk to getting slapped to getting lucky, anything is possible at The Dome.

MicroIllusions goes *all* the way!

So, you consider yourself sexually knowledgeable. When was the last time you went out on a limb in a singles bar and really scored? If you're like most people, you probably take the safe route and find yourself going home alone. Well, what if you could *safely* go out on a limb and try things that you wouldn't normally have the nerve to try? What if you could grab the girl or guy that you have been eyeing all night and lay a very passionate kiss on her/him just to see what would happen? Now there is a way. MicroIllusions has just released a new interactive "adventure" game entitled *Romantic Encounters At The Dome* in which you can use the moves and lines that you see and hear others use without fear of creating an embarrassing situation.

In *Romantic Encounters* you take on the persona of a single male or female "player" and make your way into "The Dome," a "sophisticated, hi-tech, private club situated in an ultra-posh section of Los Angeles." Once inside, you get to test your abilities with members of the opposite sex where almost anything goes. From a simple "Can I buy you a drink?" or "What's a nice girl/guy like you doing in a place like this?" to "How about breakfast at your place?" you can try it all. Even though the scenarios are text, the parser is very smart. The program has the ability to grasp the mood or feel of a situation through your responses. By using "I think" instead of "I will," the parser will add a shade of doubt to your situation that may make you appear "endearing" to your prospective date or ruin the evening by making you appear to be a wishy-washy wimp.

In addition to the normal bars and lounges that you would expect to find at a top-notch night club, The Dome also offers a specialized area for psychological sexual testing. These tests cover various areas ranging from straight-forward knowledge tests to more general situation-decision tests. In taking these tests myself, I scored very high in two and *very* low in one (I'm not telling which, though!).

After you've proven (or disproven) your knowledge of the subject matter, you can move into the world of "anything goes" to see if you really have what it takes. You can try your luck at Reception, move on to the Mezzanine Bar or go for the gusto and head on up to the Penthouse where things are really buzzing. From getting drunk to getting slapped to getting lucky, anything is possible at The Dome. In fact, it is also possible to find yourself staring down the barrel of a pistol. I actually found out how it feels to get a pre-frontal lobotomy! Needless to say, I'll avoid those circumstances in real life.

Unlike another humorous, sexually-oriented graphics adventure, *Romantic Encounters At The Dome* is a serious look at the singles scene of our times. The situations presented have probably been seen by anyone who frequents singles bars, and the results are based on real-world happenings. You have full control of the events that happen to you while at The Dome, and the only one to blame for failure (or congratulate for success) is you.

The scenarios presented in *Romantic Encounters* are very direct and can be (if you're lucky) sexually intimate. In fact, the packaging describes the game as "The ultimate text experience for 'sensual singles.'" Because of this, MicroIllusions has actually placed an "R" rating label on the package indicating that the game is "Recommended for adults. Not for use by age 16 and under." They aren't kidding about this rating. However, if you do buy the game and have youngsters who you would prefer didn't get into the game, the company has provided a security mechanism in the form of a personal password. Without the appropriate password, the game will tell the user that The Dome is a private club and then exit.

Even though the scenarios in *Romantic Encounters At The Dome* are intimate, they are by no means vulgar or exploitative. Be forewarned, however, that if sexually-oriented material bothers you, stay away from *Romantic Encounters*. Otherwise, this game can be an exciting (or frustrating) experience.



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Reviewed by Graham Kinsey

Space Ranger

Computer: Amiga
Publisher: Mastertronic International
711 W. 17th Street
Costa Mesa, CA 90292
Price: $19.99

So you recently acquired a new Amiga and have finally moved up from the eight-bit world to a much more powerful and colorful machine. But when you take a trip to your local Amiga retailer to buy your first game, you find out abruptly that most games for the Amiga cost more than $40. Being ill prepared for this case of sticker shock, you go home dejected. At home you wonder, "Are there any good games for the Amiga that won't cost me a bundle?"

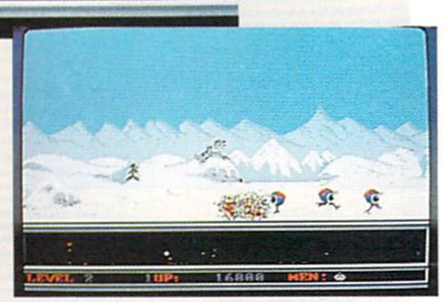
Well, low-cost entertainment alternatives for the Amiga are starting to appear. One good example is *Space Ranger*, written in part by Hayes Haugen (author of the shareware program Blitz) and Darrin Massena (author of the PD program uShow) and published by Mastertronic.

The premise for this game is that you are a S.E.P.R. (Space Environmental Protection Ranger) from a distant world, and you ensure the safety of the peaceful animals on the three habitable planets within the Beta Crucis star system. Unfortunately for the poor creatures who inhabit these worlds, they have just been invaded by the Morgdanians, a vicious pain-inflicting race that seeks to capture all the indigenous animals and bring them back for "torture before huge blood-thirsty crowds." It is your sworn duty to fend off the Morgdanians for as long as possible, while saving each native creature from a horrible fate. For tools you have an unlimited supply of Telekinesis Nets, which when dropped over one of the animals, will automatically carry it to safety. Of course you also have your trusty laser pistol, which can help you to a limited degree in destroying your enemies.

You can choose to use either joystick or keyboard controls. However, if you want to use a joystick, you will still have to use the space bar in order to drop the nets. (The joystick button is used for firing the laser pistol.)

You start your mission on the desert planet Zyphoor, then progress to the icy wasteland of planet Carvix, then finally enter the jungle paradise of Jospoor. The top three quarters of the screen displays the terrain, while the bottom quarter is used for your scope, which gives you a tactical view of the entire planet. The scope displays the location of all native animals, the Morgdanians and all the evil slave creatures employed to help catch the native fauna, the Morgdanian's Harvester ship, and your location.





Although your pitiful laser pistol can't destroy the Harvester ship, a hit can temporarily cause the tractor beam to shut down.

While you attempt to net as many animals as possible, the Morgdanian Harvester will try to hover over an animal, then turn on its tractor beam and slowly bring the animal inside their ship. Although your pitiful laser pistol can't destroy the Harvester ship, a hit can temporarily cause the tractor beam to shut down, forcing it to drop any animals in its clutches. Also, you can still throw a net on an animal while it is caught in the tractor beam. If you start to shoot at the Harvester ship with any regularity, it will launch a Pounder at you in self defense. While Pounders can't destroy you, they do repeatedly push you back and knock you off balance unless you can blast them out of existence.

You start your mission on the desert planet Zyphoor, then progress to the icy wasteland of planet Carvix.

The numerous slave creatures add to the difficulty factor by helping the Morgdanians in their task. Some of the slaves attempt to catch the animals and carry them to within range of the Harvester's tractor beam. The others are out to get *you*, some attacking from the ground, while most attempt the more successful aerial assault.

Although *Space Ranger* has good graphics, nice sound effects and a charming musical theme, what will grab you most are the creatures themselves. Many of the native creatures are very cute. On Jospoor there are smiling toads and cute teddy bear-like creatures that perform back flips and tumbles. On Carvix there are the cerunners, which look almost like blue-colored baseballs with legs and baseball caps. These creatures love to dance.

The other creatures are almost as comical as the native animals. The Morgdanians on their Sky Cycles look more like frogs wearing sunglasses and riding a flying ketchup bottle. Any Bugs Bunny fan will just love the Tasmanian Devil-like creatures on Jospoor. On Carvix there are walking rhinos that try to destroy you by throwing snowballs.

Although it isn't very complex and nothing about the game is spectacular, *Space Ranger* is still a challenging and enjoyable arcade game at a price that anyone can afford. ▣

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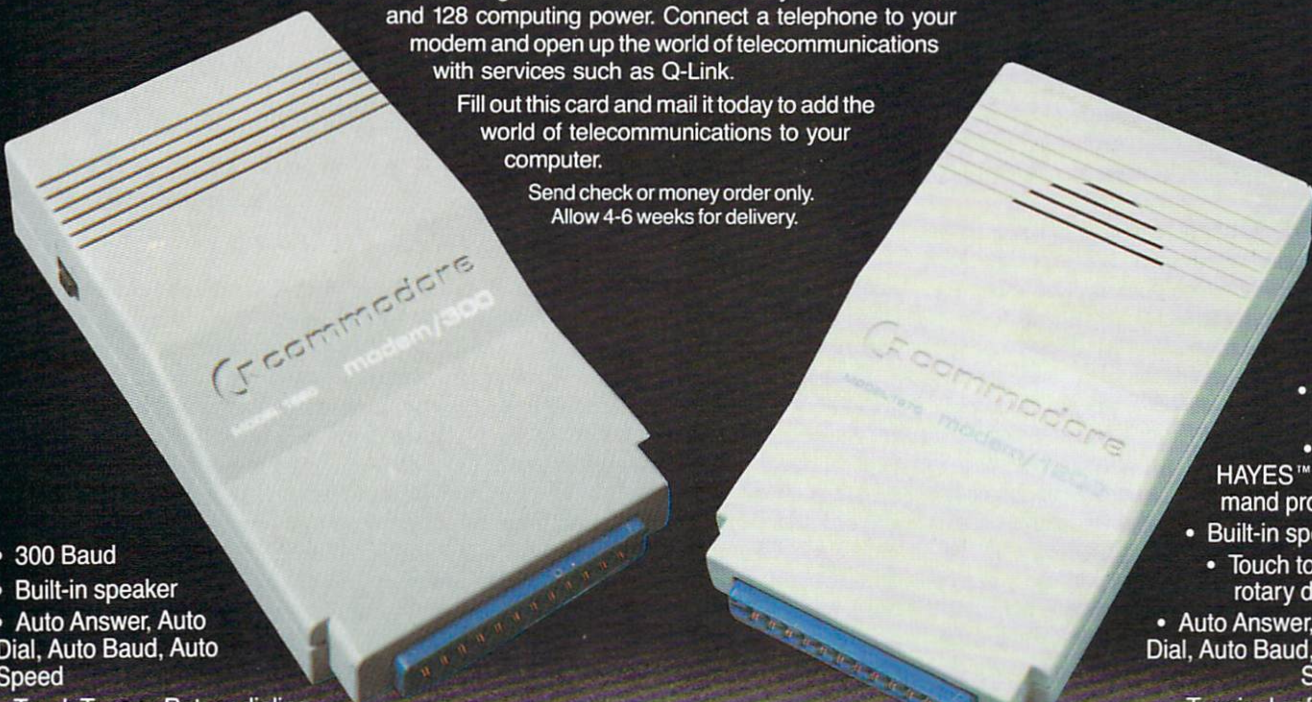
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Reviewed by Graham Kinsey

Blitzkrieg at the Ardennes

Computer: Amiga
Publisher: Command Simulations
Bldg. 3, 297 North Street
Hyannis, MA 02601
Price: $52.95

Most strategic simulation games available for the Amiga have been half-heartedly ported over from less sophisticated machines. What results is a game for the Amiga that doesn't look a whole lot better than the eight-bit version. Fortunately, this trend is starting to be broken. Command Simulations has released *Blitzkrieg at the Ardennes,* a World War II simulation written specifically for the Amiga.

Blitzkrieg at the Ardennes is a simulation of the well-known "Battle of the Bulge," which took place on December 16, 1944, when German troops attempted to break through weakened Allied troops in Belgium to capture the Liege and eventually Antwerp. In *Blitzkrieg* you can control either the attacking Germans or the defending Allies with the computer or a human opponent taking the opposite side.

Upon booting the disk and running the program, you are first presented with the load/save screen. To start a game, you can either load the file "dec 16 0800 germans" or just hit the Cancel gadget. If you hit the Cancel gadget, you will get to initially deploy, move and select engagements for every unit in the German force. Loading the supplied file gives the human-controlled Germans a big advantage, as they will have already been deployed, moved and set up for engagement with Allied troops.

After selecting the scenario, you are presented with the control screen. You can select one- or two-player mode and the level of difficulty in one-player mode. You can also control the weather for each of the 15 days of the battle. Weather can be either cloudy or clear, determining whether each side will be able to bombard from the air that morning. (The lack of aerial bombardment ability is a major detriment to the Allied side, since they have three times as much air power as the Germans.) You can also scale down the reinforcements for either side; this will only slightly hurt the German troops (since they don't receive many reinforcements anyway) but can put a severe damper on the



If you have a stereo hooked to your Amiga and turn up the volume, the explosions and other sounds add realism to the game that just can't be matched.

strategic defense of the Allied troops. Once you have completed the control screen, the simulation commences.

There are three resolutions in which to view the battle terrain. Low-resolution view allows you to see the entire battlefield. In this view all units appear as colored dots. Medium-resolution mode displays almost half of the battlefield. Each unit displayed and all empty hexes adjacent to a unit are outlined in red (German unit), blue (Allied unit), or yellow (adjacent to both German and Allied units). Artillery units are displayed in a different shade than other units of the same side in this view mode. The high-resolution mode displays all aspects of a tiny portion of the battlefield. You can perform actions on units only in the high-resolution mode.

Each side conducts its own turn in rotation, the Germans always going first. If it is a clear morning, air bombardment is conducted. You can either bombard an enemy unit or fuel dump. If reinforcements are being received, you will choose when to deploy them.

The movement phase starts next. You can first collect up to 27 different units to move. If you want to know where a certain unit can move, then select the Where option, and the medium-resolution mode will appear and outline all possible moves. After you have moved the units you can select enemy units for your artillery units to fire upon. Then you select engagements, choosing how your units will fight adjacent enemy units.

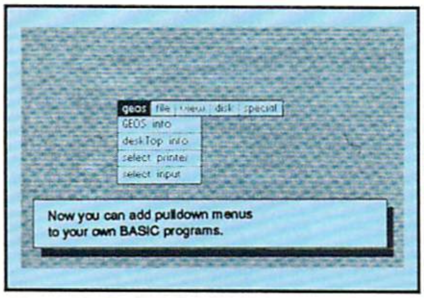
The combat phase of the turn commences when you have done all the moving and engaging you want and you select the resolve option. All artillery programmed to fire during the movement phase will fire against the targeted enemy units. All engagements will be resolved. The attackers and/or defenders in each engagement may be eliminated, exchanged, reduced in attack/defense power, forced to move back or given the opportunity to advance on the retreating enemy.

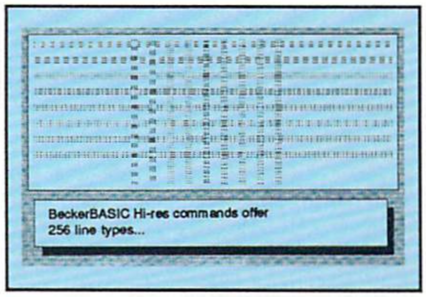
The attributes of the different units in *Blitzkrieg at the Ardennes* are one of the most important things about the game. Each unit has an attack/defense and a movement rating visible in the high-resolution view. The attack/defense rating tells how powerful the unit will be in an attack and its base defense value (modified by the existing terrain). The movement value tells how many clear hexes without a major road the unit can move through in one turn. Each unit also has a power bar, which indicates its current strength compared to its original strength, which is important if you want to use the Join Units option to combine two weakened units into one strong unit. There may be up to three dots on the right side of each unit's display box, which tell you if the unit has been moved from its original location, if it has been targeted by enemy (or friendly) artillery, or in the case of Artillery units if they have been assigned a target.

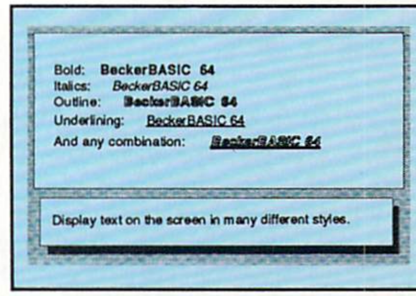
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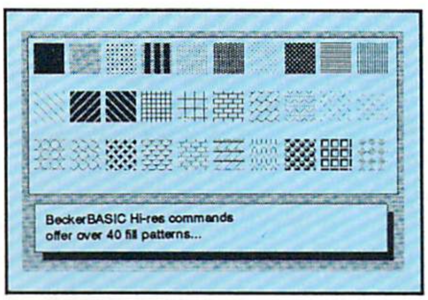
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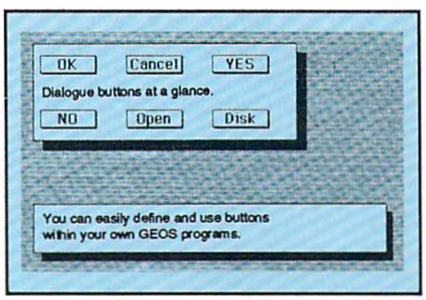
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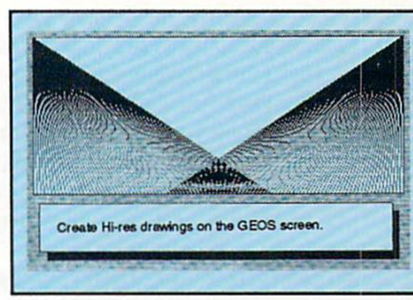
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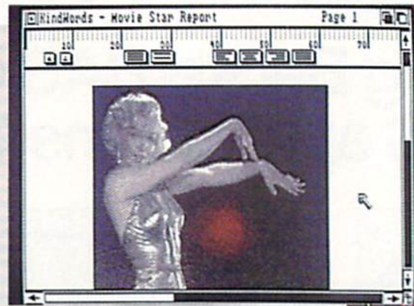
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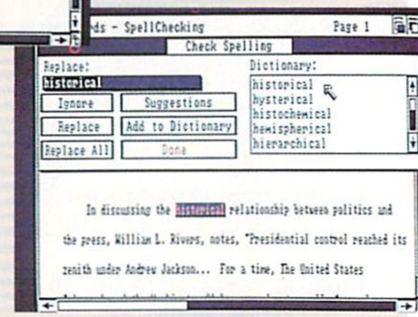
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Reviewed by Gary V. Fields

KindWords

Computer: Amiga
Publisher: The Disc Company
3135 S. State St.
Ann Arbor, MI 48108
Price: $99.95





One of *KindWords'* nicest and most powerful features is the inclusion of two unique keyboard modes called foreign and symbols.

KindWords is more than just a powerful word processor. It lets you mix both words and graphics, has a quick 90,000-word spell checker and includes most of the editing features you would expect in a professional word processor, plus it allows you to include foreign language letters and symbols in your documents. The program uses the WYSIWYG format so the screen displays everything just as it will appear when printed. Font changes, styles and sizes are all shown on screen. If you have a color printer, you can even print graphics in color.

Those who use the program only for word processing will be happy with its logical features. All of the most often-used features like cut/paste, headers, footers, file handling, formatting and help are included and can be summoned with either the mouse or keyboard. I always appreciate programs like this one which offer on-screen help. Two different help options are always accessible. One displays the name and functions of the most often-needed options, and the second lets you scroll through several screens of all the different keyboard command sequences. These two options mean those of us who hate to waste time referring to a manual need never look up the proper command again.

The question that needs to be answered is: "Does the world need another word processor?" Bob Kotick of the Disc Company, said they recognized that there were already good word processors on the market for the Amiga, and rather than try to "reinvent the wheel" the company decided to offer a word processor with expanded power. They did that by making *KindWords* more than just another good, English language word manager. It's okay to use *KindWords* for routine communication chores, but because the program allows the inclusion of IFF graphics with text it can do more than just manipulate words. It can help you produce documents which not only inform but will also get your reader's attention. You can mix text with different font faces and styles including superscript and subscript and can change the appearance by simply highlighting the text and reformatting it.

One of *KindWords'* nicest and most powerful features is the inclusion of two unique keyboard modes called foreign and symbols. The first lets you include text with special accent marks, and the second supplies special character size graphics which you can type directly into your text. To toggle between the three keyboards (normal, foreign and symbols), you simply select from the pull-down menu and—presto! the keyboard responds. The foreign overlay lets you use special accented letters. The symbol overlay lets you mix graphics like pointing hands, musical notes, directional arrows, grids, copyright and trademark symbols with your normal text. By the time you read this review, there should be French, German, Italian and Spanish versions of *KindWords* (complete with foreign language manuals) as well as English. Regardless of the language, they all let you mix fonts and sizes, graphics and symbols within a document.

The company is also releasing disks with special keyboard overlays which contain technical symbols. Thus a scientist or engineer can incorporate symbols related to his or her profession in letters, memos, notes, etc. To include these special characters, all you do is select the overlay from the pull-down menu and type. For instance, depending upon which overlay you choose from the current Font Menu, the letter "F" could print as "F," an accented "A" or an arrow pointing to the left. This may sound confusing when reading about it, but in actual use switching between and using these special fonts is very easy.

When reviewing a new product, it is natural to compare it to similar software on the market. *KindWords* could be compared to *Desktop Vizawrite* or *ProWrite*, because it allows you to mix graphics within your text, but it also resembles *WordPerfect* in some respects. Many of the program's keystroke commands mimic *WordPerfect*'s. For instance, the numeric keypad is used to move the cursor around quickly. But unlike *WordPerfect*, the keypad responds as a cursor control only if the keys are pressed along with the ALT key. I actually like this arrangement better than *WordPerfect*'s which requires you to press SHIFT before pressing a key to produce the number itself and without SHIFT serves as a cursor control. But because many of the commands parallel the IBM version of that word processor, those upgrading from MS-DOS will have little trouble adjusting to *KindWords*' controls. The program handles graphics like *Vizawrite*—as wide blocks which allow text above and below. But unlike *Vizawrite*, *KindWords* also lets you crop and resize graphics. And like *ProWrite*, the program allows graphics with multiple colors.

The program comes on two copyable disks. One contains the word/graphic processor while the second includes the program's special printer utilities and 90,000-word spell checker. Because of this, it is much easier to use *KindWords* with two drives or a hard drive than a single drive. The program also checks to see how much free memory your system has the first

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by Howard Millman

Language Arts and Creative Printing

Educational software that sustains a child's interest while teaching fundamental building-block concepts can be hard to find. We'll look at programs that can do just that.

Teachers and parents, do your kids tend to take mental vacations while at the keyboard? Do they drift off into the ether?

In this, the second article of our continuing series we offer an antidote—entertaining courseware. These programs are "imposters," they masquerade as games to capture the students' interest. When that's accomplished, they can then satisfy their covert mission of enhancing scholastic skills.

We reviewed more than a dozen programs for this month's column. We selected two emphasizing language arts and one creative printing program.



Verb Viper



Teddy Bear-rels of Fun



Easy as ABC

Verb Viper

Computer:	Commodore 64
Ages:	5-10 years
Publisher:	DLM Software 1 DLM Park P.O. Box 4000 Allen, TX 75002 (800) 527-4747
Medium:	Disk
Price:	$36.00 (home version) $46.00 (school edition)
Emphasis:	Spoken and written linguistic skills Recognition of subject-verb agreement

Admittedly, it's hard for students to get excited over subject/verb form agreement. However, *Verb Viper*'s fast graphics, accompanied by pulsed sound effects, will relieve the tedium.

DLM's *Verb Viper* is a long-necked dragon that eats, predictably enough, verbs. He's anchored opposite four stacked caves from which verbs continually flow.

The rules of the game are elementary. A short variable context sentence is displayed below the dragon. Verbs flow out of choice is correct). Easy enough to decide the cave horizontally towards the ravenous reptile's mouth. If the verb agrees with the sentence's subject in tense or inflection, then the student presses the space bar or joystick button to flick the verb into the viper's mouth. If the verb doesn't agree, the student does nothing.

The level of challenge can be tailored to the student's needs. Nine speed levels govern the rate at which the verbs are expelled. Also, four Content Levels are offered underscoring the verbs' tenses (past/present) and inflection (singular/plural). Content Level one consists of passive verbs, Level two is present tense action verbs, Level three includes regular and irregular past tense verbs, and Level four proffers past participles.

Other options that further customize the game to the players' varying skill levels include four difficulty steps (for each of the four Content Levels) as well as a run time option offering a game length varying from one to five minutes. Options are changed by simultaneously pressing the CONTROL and "P" keys. Unfortunately, there are no provisions to modify the program's set of core verbs.

Verb Viper seeks to achieve its aim based on repetition and reinforcement—drill and practice. Total and current game scores are displayed as a means to chart the student's progress.

At its lower levels and slower speeds this is a reasonably simple game, but raise these levels and the challenge escalates. Should my description portray the game as deceptively simple here are some choices from Content Level four: "You had rode/ridden," "they had ran/run," "a writer has hid/hidden" (in all cases the latter choice is correct). Easy enough to determine now, but imagine these streaming out less than one second apart.

Because I'm rusty at this type of drill I foundered in difficulty Level two, Content Level three. I insist the cause was unfamiliarity with the program and not cerebral oxidation.

In all respects *Verb Viper*, one of DLM's highly regarded Arcademic series, is professionally executed. We reviewed the school edition, this version contains a comprehensive teacher's manual detailing the concept and execution of the product. It also offers extensive suggestions and strategies for linking *Verb Viper* into the curriculum.

Part of the Academic rationale is to start students where they aren't, then move them back or ahead as indicated by their scores. Included with the package are reproducible masters for tracking students' progress through each of the program's successively more difficult levels. The instructor (or parent) can chart a student's progress based on game scores. This visual accounting is a yardstick to measure the student's progress and signals when and how help is required.

The home version excludes the charts but includes a user's guide.

If DLM issues an updated version of *Verb Viper* we'd like to see it incorporate three improvements. First, the ability to accept and merge user-supplied verbs and sentences. Second, add a discriminating algorithm. This latter feature would eliminate grammatically correct but illogical sentences. Our third priority is a printout feature that would, say, depict

the *Verb Viper* embossed on a certificate to be awarded to students who achieve a defined rate of improvement.

Easy As ABC

Computer: Commodore 64
Ages: 3-5 years
Publisher: Springboard Software
7808 Creek Ridge Circle
Suite 110
Minneapolis, MN 55435
Medium: Disk
Price: $39.95
Emphasis: Alphabet sequencing skills
Recognition of upper and lower case letters
Shapes and sounds of letters

This program, crafted for younger students, is considerably more forgiving and unhurried. *Easy As ABC* is geared toward pre and early readers, so its opening menu is graphic. Students chose from the disk's five games by moving the oversized cursor into the picture and pressing the space bar or joystick button. While the games can be played via the keyboard, we recommend that students use a joystick.

"Dot to Dot": The most visually rewarding of the offerings. A series of sequentially lettered dots must be connected to reveal a hidden picture. The student moves to the dot bearing the earliest letter and proceeds to the next letter in the sequence. Pressing the joystick button at the next correct letter results in a connecting line between the dots. These lines schematically reveal the underlying sketch, usually of an animal. When the final line is drawn the sketch dissolves in a kaleidoscope of colors, replaced by a vivid graphic.

"Match Letters": The straightforward challenge here is to pick up scrambled letters at the bottom of the screen and match them with their unscrambled duplicates displayed across the top. When all letters (usually five) are relocated, a colorful graphic related to the unscrambled match word emerges.

"Leap Frog": This, the easiest of the five games, depicts three frogs sitting on a log. The first and third each wear one letter, the middle frog is blank. The student selects the missing letter from six displayed on the screen. If the choice correctly completes the three-letter pattern, the frog leaps, smiles and burps.

"Lunar Lander": Five randomly-arranged letters sit at the screen's bottom. The challenge is to chose them in the correct order and move them to any spot on the screen. At the game's end a lunar shuttle zips from the initial to the last letter with a roar of rocket engines.

"Honey Hunt": The bee perched atop the hive obtains nectar only from the tulip-shaped flowers containing matching upper and lower case letters. The student guides the bee, via the joystick, into one of four oversized flowers. If the choice is correct the furry bugger drinks the nectar and returns to the hive. After four correct choices, although not necessarily in a row, the hive is filled with honey and the game resets. As in most of the games the CONTROL and "A" keys toggle between upper and lower case letters.

The first four *Easy As ABC* games foster character recognition and sequence. Leap Frog, which deals with only three letters is unquestionably the simplest, Lunar Lander the most advanced.

Most often the initial letter sought is not an "A"—it can be any letter in the alphabet. With some children this added complexity can lead to added mistakes. Fortunately, the program treats errors lightly, especially important for younger students. Usually, the program sounds a musical note then offers various kinds of feedback. In one case the letter of choice will flash or in another the alphabet prints rapidly across the bottom of the screen.

Overall, *Easy As ABC* is a pleasantly paced, multi-faceted and well implemented game. Built around animals and space travel themes it appeals to even the youngest of children.

Conclusion

Verb Viper, geared toward older students, is considerably faster moving and more challenging. It will likely require adult intervention because of the size and resultant complexity of its menu choices. In fairness, however, its intended use is primarily in schools, although we feel it can be just as effective in a home learning environment.

Conversely, *Easy As ABC* is an above average primer for non and early readers which can be readily used in a home or in a formal educational environment. Either way, only minimal adult supervision is required. Also, because it's geared to younger children, the mix of programs is beneficial since a child's attention span is often proportional to age.

These two programs, each within their respective genres, are dynamic performers. The typify "imposter software"—they're colorful, energetic, and above all, educational.

Columnist's Choice

While this program doesn't quite fit our definition of "entertaining courseware," it is being used in conjunction with some schools' curriculum and deserves an honorable mention:

Teddy Bear-rels of Fun

Computer: Commodore 64
Ages: 4-7 years
Publisher: DLM Software
1 DLM Park
P.O. Box 4000
Allen, TX 75002
(800) 527-4747
Medium: Disk
Price: $39.95

DLM delivers what the package's name promises, this appealing printer utility is easy to learn and fun to use. It creates oversized posters, page-sized pictures and labels designed with props and icons chosen from the two-disk set's ready-made graphics.

The characters are teddy bears portrayed in various activities and scenes. To depict them making a snowman in winter or picnicking at the beach in summer is a matter of merely selecting the appropriate background and props. The teddy bears come in three sizes and dozens of poses. Children have their choice of seasonal outdoor environments as well as many props.

Printouts can include the student's distinctive captions and messages. (Even adults who possess a capricious sense of humor may find whimsical uses for the posters.) While *Teddy Bear-rels of Fun* is no threat to Hallmark's market share, the creations are, at least, uniquely the user's own.

True to DLM's educational software tradition they include a seven-page pamphlet describing related scholastic activities for young children. Most of these activities use the program peripherally to illustrate seasons, letters or numbers. But whether kids are making mobiles, sorting by size, or practicing letter recognition, the colorful teddies will capture and focus their attention.

And as long as students are focusing on Verb Vipers, Lunar Landers and even teddy bears, they won't be so tempted to leave for a mental vacation.

If you have any suggestions, questions or comments about this column, the software covered or future topics, please write to Howard Millman, care of this magazine.

by Matthew Leeds

The Language of Video

Technology and terminology have always gone hand in hand. As equipment gets more sophisticated and more complicated, so does the language used to describe it. The importance of using the correct terms for events, processes, hardware and software increases in direct proportion to the likelihood of misunderstanding when the wrong term is used. When I started using my Amiga I discovered a new set of terms to master—CLI, Workbench, initialize, Fast RAM, Zorro—and new meanings for some familiar terms—device, gadget, window, screen. Understanding the precise meaning of each of these terms as it relates to using my Amiga gave me a deeper appreciation of how to better use my Amiga.

Video has a its own language. Like most languages it shares words with its parent tongue that have different meanings, and it also has it share of jargon—words created to define or identify things specific to video. Understanding the precise meaning of video terms is critical to understanding how video works and working with video. Two of the video concepts most frequently confused by Amiga owners are genlocking and digitizing. At the simplest level a genlock synchronizes two or more video signals to allow overlaying or editing, while a digitizer converts a video signal to a bit-mapped image. Simple, right?

The Basics

Let's start with the basics of video. Imagine a test pattern, a card shaded from white to black, smoothly graded through all the shades of gray. Now point a video camera at the card. The black portion of the card creates no response in the video camera, and the signal output is zero. The white portion of the card creates the maximal response from the camera, and the signal output is one. The gray portion of the card produces a sloping response. (See Illustration 1) This is the basis for all video, black and white or color. The video signal is a curve that varies in direct proportion to the brightness of the object being imaged. This type of signal is called an analog signal. Every tiny difference in gray on our test card is represented by a change in the slope of our signal.

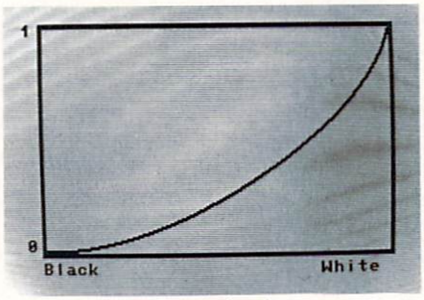


Illustration 1

This ability to represent small changes in brightness gives video its excellent imaging quality.

Unfortunately, computers operate in a digital world. They cannot understand a minute change in voltage that represents a difference in brightness of a subject. They only understand bits—on or off. Converting an analog video signal to a digital data structure is the job of a video digitizer.

How a Digitizer Works

The simplest digitizer samples an analog video signal and sets a threshold limit. Any signal above the limit would be seen as white, below the limit as black. This would give us an image that was only black or only white. Each point on the screen (called a "pixel," for "picture element") would be represented by a single bit that was either on or off. If we want to create a better representation of the original image we need to use more bits per pixel. Using two bits per pixel gives us four colors: black, white and two shades of gray. The Amiga is capable of four bits per pixel and can therefore display sixteen levels for each pixel. (We are dealing with a high-res screen display, since it most closely simulates a full-screen video image. We will also stick with a black and white only display for now.) As we increase the number of bits used in the sample we get a closer approximation of the original analog curve. The process of sampling the analog video signal and converting it to a digital image is sometimes called quantization. Since we are re-creating the smooth analog curve in discrete steps, occasionally we will get only a rough approximation of what the original looked liked. This is known as quantization error.

It would seem that you would always want to digitize at the maximum number of bits possible. There are, however, tradeoffs that are made as you increase the number of bits used. The more bits you use in a sample, the more RAM you need to store the sample in. A 640x400 display,

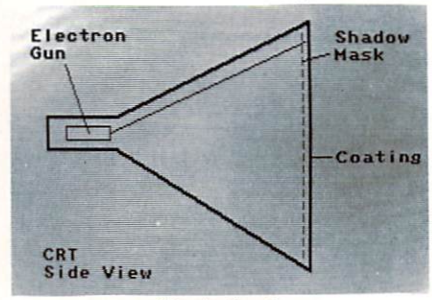


Illustration 2

sampled to one bit would require 32K of chip RAM (640 x 400 x 1 bit/8 bits per byte = 32K bytes). Sampling to four bits quadruples the amount of RAM required to 128K. (Your disk files may not be this large since IFF graphic files are compressed on disk.)

Another tradeoff is in time. The more bits you want to sample, the longer it takes. You either need to increase the sampling time or increase the sophistication (cost) of your sampling hardware. Part of the problem is the large amount of data that must get moved from the sampling hardware into RAM on your Amiga. Generally digitizers that work in real time either attach directly to the bus or have sufficient on-board RAM to store an image. Video digitizers are sometimes called frame grabbers, but this generally only applies to those digitizers that work in real time.

More Video Technology

There are other components to a video signal than just the brightness (luminance) level. Understanding some of these other components will help us to understand the uses of a genlock. Every television set (and the monitor for your computer) uses a cathode ray tube (CRT) for its display. If you were to cut one in half (See Illustration 2) you would see at the small end an electron gun and at the large end a shadow mask in front of phosphor coating on the inside of the tube. The electron gun shoots electrons through the shadow mask onto the phosphor coating. The coating glows for a fraction of a second when it is struck by an electron. By painting across the entire face of the CRT an image can be created. Rather than creating the image in a random fashion, the electron beam is moved across the face of the CRT a line at a time. As the beam reaches the end of each horizontal scan it is turned off, the electron gun is pointed back to the left and down a line, and the next line is drawn.

The time the electron gun is off is called the horizontal retrace, and it is controlled

by a signal called the horizontal sync. When the electron gun reaches the bottom of the screen it is turned off, moved back to the top left of the screen and the next field is drawn. This is the vertical retrace, controlled by the vertical sync.

There are other components to the video signal besides the horizontal and vertical syncs. Up to now we have been dealing with just a black and white video image. When we add color, things get more complicated. Now we not only have the luminance information to keep track of, but we also have Red, Green and Blue color information. I'll refrain from going into the details of how color information is carried, but basically the color component is called the color sub-carrier.

How a Genlock Works

Now imagine you have two video sources connected to a switch. The switch is connected to a monitor. Let us call the video sources A and B. Source A is currently on the screen. You turn the switch to watch source B, and the image on the screen does a roll, changes color, and finally stabilizes. What happened? The video circuitry in the monitor was synced to video source A. The horizontal and vertical timing and the color sub-carrier timing of video source B were different. It took a moment for the monitor to "lock" onto the new signal. If the two video sources had the same sync and sub-carrier timing there would of been no roll or color shift. (This assumes your switch does not lose the video signal during switching.) This in essence is what a genlock does.

A genlock on the Amiga accepts a video signal from an outside source and "locks" the Amiga's video timing to the timing of the external source. The two video signals are then said to be "in sync."

There is another feature found in Amiga genlocks that is not generally found in genlocks manufactured for video use. This is the ability to overlay the Amiga's graphics on the external video image. Some confusion still exists on just how this process works, so an explanation is in order.

The Amiga has a color palette of 4096 colors, and can display up to 32 colors at once in low-res mode. (We will ignore HAM mode for this discussion.) In high-res mode 16 colors can be shown. The specifics of which 16 (or 32) colors are actually seen out of the possible 4096 are stored in the Amiga's hardware color registers, numbered in typical computer fashion 0 through 31. Each pixel on the screen is assigned a color by being associated with a specific color register. By changing the value stored in a color register, every pixel on the screen associated with that register will change to the new color stored in that register. It is possible to display the external video image wherever a pixel is assigned to color register 0, regardless of what color palette information is stored there. In effect you are replacing color 0 with the external video image. This can be thought of as "keying" the external video signal into color 0.

General Considerations

There are two important areas to consider when you are using your Amiga in video applications. The first is overscan. Most programs on the Amiga have a maximum resolution of 640x400. This leaves a border on all four sides of the image. Real video does not have this border. When you watch television notice the special effects. They occur all the way to the edges of the screen. To produce real video, programs on the Amiga must be able to run in overscan mode. This eliminates the border on the monitor.

At the time this article was written none of the video digitizers on the market for the Amiga supported overscan. Overscan mode may require additional memory on your Amiga. It is generally defined as a display size of 704x480. Notice that all real video is interlaced. Yes, it flickers on the screen. So does real television; you just haven't noticed it. Take a close look at titles on late night local television. If they make poor choices regarding the colors used, you will see flicker there as well. You should always preview all Amiga-produced effects on a standard NTSC monitor.

The second consideration is the term "broadcast quality." You may often see this along with another term: "RS-170A." Video signals in the United States are produced in accordance with a standard called NTSC RS-170A. Full compliance with this standard is required for any video signal broadcast over the public airways. It is expensive, time consuming, and requires a large investment in sophisticated hardware to maintain compliance with broadcast quality RS-170A. It is also unnecessary unless you plan to broadcast your videotapes.

A good rule of thumb for determining the quality of a genlock (and I'm sure to get mail on this) is if you pay less for the genlock than you paid for your VCR, don't expect anything near "broadcast quality." A second rule of thumb is that if your VCR doesn't accept an external sync don't worry about "broadcast quality."

Specific Applications

The list is endless. A genlock lets you add titles, draw diagrams on top of live video, perform glitch-free editing, add programmable fades, mix computer animation and video, and for Amiga 500 and 2000 owners a genlock provides an NTSC video output.

Video digitizers let you create a whole host of special effects including wipes and fades, posterizations, freeze frames, color cycling effects, image processing and paint program effects. If you are considering a purchase, start by making up a list of what you want to be able to do with your new hardware. Then start asking questions. Talk to your local Amiga dealer, write to the manufacturers for more information, ask for recommendations or sample output from others using the products you're considering. The list of developers below may be of some help.

A-Squared Distributions, Inc.
6114 La Salle Avenue
Suite 326
Oakland, CA 94611
(415) 339-0339
Live! (video digitizer)

Digital Creations, Inc.
1333 Howe Avenue
Suite 208
Sacramento, CA 95825
(916) 344-4825
SuperGen (genlock)

Mimetics Corp
P. O. Box 1560
Cupertino, CA 95014
(408) 741-0117
AmiGen (genlock)
FrameBuffer (video digitizer for 2000)

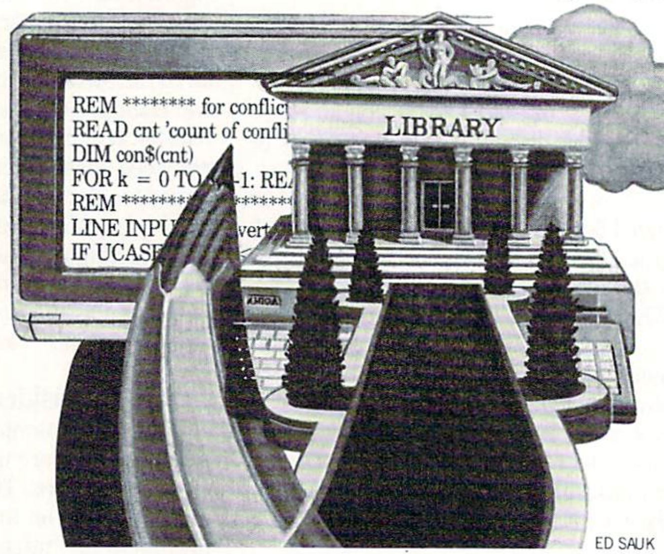
NewTek
115 West Crane Street
Topeka, KS 66603
(913) 354-1146
DigiView (video digitizer)
Video Toaster (digitizer and special effects for 2000)

Progressive Peripherals and Software
464 Kalamath Street
Denver, CO 80204
(303) 825-4144
ProGEN (genlock)
FrameGrabber (video digitizer)

SunRize Industries
3801 Old College Road
Bryan, TX 77801
(409) 846-1311
Perfect Vision (video digitizer)

by Tim Jones

AmigaBASIC Tutorial



ED SAUK

One of the questions that I hear most often concerns the use the the .bmap files and libraries from AmigaBASIC. Therefore, let's take the next couple of installments and explain the .bmap files, the __fd files and ConvertFD, and the actual uses for libraries in AmigaBASIC.

Declare Function?

Since the early installments of my tutorial series, you have seen statements that involved lines like:

DECLARE FUNCTION OpenDiskFont& LIBRARY
LIBRARY "diskfont.library"

These lines allowed the use of the built-in and disk-based library functions that programmers using the C and Assembler programming languages use constantly. With AmigaBASIC, however, the use of these libraries is a feature rather than a requirement since the routines required to print a line of text and draw a line are built in. In the other compiled languages, people are quite often forced to use the libraries just to do the things that BASIC programmers take for granted.

When we have used library functions in the segments of the tutorial series, most have been to make creating a routine easier and more code-efficient than that same routine's BASIC counterpart. For example, we looked at how to create a pseudo-requester with BASIC functions and then, in the next installment, created a similar demonstration using the actual Intuition functions designed specifically for handling requesters. The second example was much more efficient in coding than the first, but required the use of calls to functions in various system libraries.

What is a LIBRARY?

A library is a series of functions, or subroutines, that have been written for the purpose of simplifying program writing on any computer. In a small computer, like the Commodore 64, the library functions are in ROM, or Read Only Memory and can be accessed via peeks, pokes and SYS's. These functions are often referred to as the Operating System or Kernal. On a machine like the Amiga, however, the libraries are more often software modules that make updating the routines much easier. In a ROM-based environment, you must upgrade your libraries by changing physical microchips, while a software-based Kernal can be changed by simply using a new disk. Examples of this type of change would be moving from MS-DOS 2.10 to 3.30; the update simply involved going out and purchasing the new MS-DOS package from your local dealer. In the Amiga environment, we have a little bit of both worlds. For an Amiga 500 or 2000 owner, an upgrade requires both a new set of Kickstart ROM chips and a new set of Workbench disks. For a 1000 owner, on the other hand, an upgrade simply requires a new set of disks, both Kickstart and Workbench.

When an Amiga boots, some of the libraries are pre-loaded for you as a function of Kickstart. This includes libraries like GRAPHICS, DOS and INTUITION since the system software can't operate without these being available. Other libraries, like DISKFONT and TRANSLATOR, are loaded by the program requiring them.

Even AmigaBASIC itself calls the TRANSLATOR LIBRARY when you use the TRANSLATE$ function. To see this in action, boot your system and then remove your SYS: disk. Now open AmigaBASIC and type the following in the OUTPUT window and hit RETURN: SAY TRANSLATE$("Hi There")

If you haven't re-assigned the Libs: directory to some other disk (for you hard drive users), you will be greeted by the "Illegal Function Call" requester when AmigaBASIC goes out in search of the TRANSLATOR LIBRARY file. This is because TRANSLATE$ makes direct calls to the TRANSLATOR LIBRARY, and since it can't find it, AmigaBASIC doesn't recognize the function as a valid AmigaBASIC function.

Enter .bmap Files

For any of the other library calls that you might want to make, however, you must let AmigaBASIC know that you are going to be making the call. Therefore, we need a way to let AmigaBASIC know where to look in the libraries for the function or routine that we are calling. The first step is to introduce the library to AmigaBASIC. This is done with the LIBRARY statement. To allow your program to use the GRAPHICS library functions, initialize the library like this: LIBRARY "graphics.library".

This causes AmigaBASIC to look in a couple of locations for for a file called "graphics.bmap". The first place that is scanned is the current directory that you are in, then it looks in the Libs: directory, which is usually on your SYS: or Boot disk. If the file is found, it is accessed by AmigaBASIC for the duration of your program's run, unless you issue a LIBRARY CLOSE command.

Therefore, once you have the .bmap files needed for programming, it is suggested that you copy them over to wherever your Libs: directory is when you are programming in BASIC. I place mine in the Libs: directory of my DH0: hard disk since I ASSIGN Libs: to it when I boot my system.

Where do I get them?

The next question is, "Okay, I know I need the .bmap files, but where do I get them?" The folks at Commodore have been very thoughtful and included a directory on your EXTRAS disk called FD1.2. In this directory is a series of files with the information that AmigaBASIC needs to access the various library

functions. The problem is that they are not in a format that is readable by AmigaBASIC. The first two, and most used, of the .bmap files are already converted for you on your EXTRAS disk in the BasicDemos directory. They are "graphics.bmap" and "dos.bmap". To use the functions in them, you should copy them into your Libs: directory (from the CLI) type:

"COPY EXTRAS:BasicDemos/#?.BMAPLIBS:"

This will ensure that they are available for your program no matter which sub-directory you may be working in. The remaining .bmap files must be created from the __FD files that I mentioned above. Carolyn Scheppner (Commodore Amiga Technical Support) has kindly provided us with a program to perform the conversion for us. The only problem is in the naming of the files. To save some of the work involved with using ConvertFD, I suggest making the following changes.

```
   DEFINT a-Z     'by default, all variables ares integer

   REM ******** for conflicting tokens ********
   READ cnt        'count of conflicting tokens
   DIM con$(cnt)
   FOR k = 0 TO cnt-1: READ con$(k): NEXT
   REM ****************************************

   LINE INPUT "Convert A)ll .fd's or O)ne specific one? ";Ans$
   IF UCASE$(Ans$) <> "A" THEN CnvtOne

 CnvtAll:

   LIBRARY "dos.library"
   DECLARE FUNCTION Execute& LIBRARY

   Ex$ = "List > RAM:FDList pat #?.fd"+CHR$(0)
   CHDIR "Extras:FD1.2" ' or whatever your disk may be called
   x = Execute&(SADD(Ex$),0,0)
   OPEN "RAM:FDList" FOR INPUT AS 3 LEN = 1028
   WHILE NOT EOF(3)
     LINE INPUT #3,Fi$
     FD$ = LEFT$(Fi$,INSTR(Fi$," ")-1)
     BMAP = INSTR(FD$,"_")
     IF BMAP = 0 THEN
       CLOSE
       KILL "RAM:FDList"
       END
     END IF
     BMAP$ = LEFT$(FD$,BMAP-1)+".bmap"
     CLOSE 1 : CLOSE 2
     OPEN FD$ FOR INPUT AS 1
     OPEN BMAP$ FOR OUTPUT AS 2
     PRINT "Converting "+FD$+" to "+BMAP$
     DoAll = -1
     GOSUB DoFile
   WEND

 CnvtOne:

   INPUT "Enter name of .fd file to read > ",fdFilename$
   OPEN fdFilename$ FOR INPUT AS #1
   INPUT "Enter name of .bmap file to produce > ",bmapFilename$
   OPEN bmapFilename$ FOR OUTPUT AS #2

 DoFile:

 etc...
```

With the remainder of the program following as it is.

With these changes made, you will be able to convert all of the .fd files without having to keep track of their names. For the output file's destination, you could change the line:

BMAP$ = LEFT$(FD$,BMAP-1) + ".bmap"

to:

BMAP$ = "Libs:" + LEFT$(FD$,BMAP-1) + ".bmap"

This would ensure that the resulting .bmap files would end up in your Libs: directory where they can always be found.

What use are they?

Now that you have this nice collection of files in your Libs: directory, how can you use them? Well, as I mentioned above, there are many reasons for using the library functions, but unless you know what they are and how to call them, these files are pretty useless. If I were to start describing the various routines available to you from the libraries, you probably wouldn't see this in print, because it would have to be spread out over three dozen issues, each dedicated simply to this discussion. Therefore, I suggest that you get your hands on two books that describe the functions of all of these libraries. The first, *Amiga Programmer's Handbook,* is in its second edition and covers all of the functions except those in the "dos.library." It is written by Eugene Mortimore and published by Sybex. (See review in May 1988 *Commodore Magazine.)* The second is published by Bantam Computer Books and is called *The AmigaDOS Manual.* It is also in its second edition. Both books contain information that lets you know which functions in which of the libraries does what.

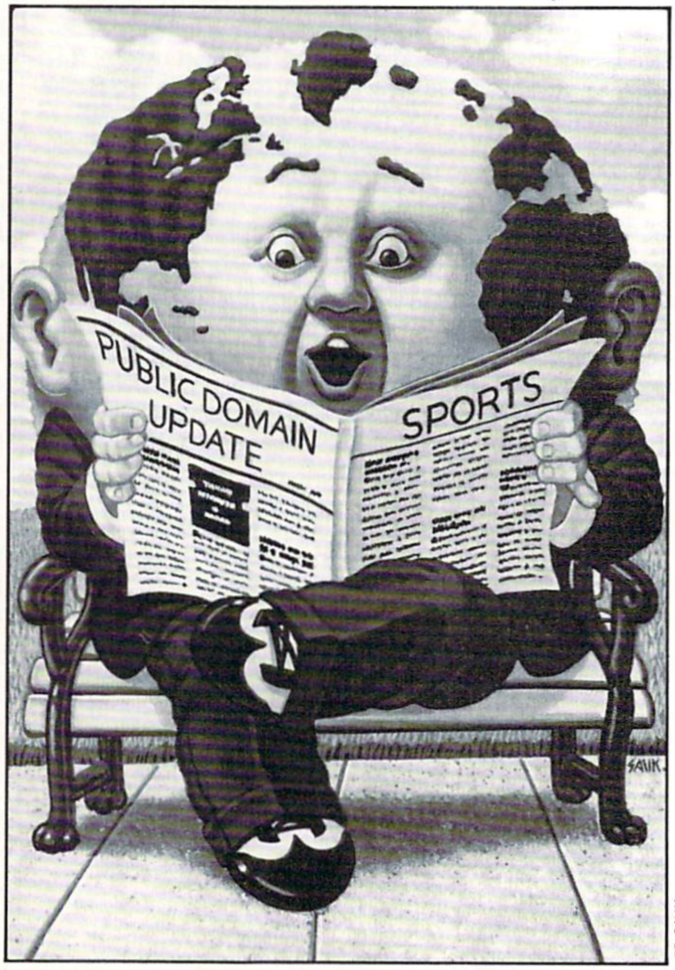
For example, the changes that I suggested above for ConvertFD make use of the Execute function found in "dos.library." The reason that I made use of this in the conversion program is that its .fd file has already been converted for you, and can be found in the BasicDemos directory on the EXTRAS: disk. The function Execute is fully documented in the Bantam book, *The AmigaDOS Manual,* in the Developer's Manual section, as are all of the other functions available through the DOS library.

Where to now?

For this installment, we'll break off here. In the next issue, we'll include a program that will allow you to disect the .bmap files and also explain the contents of the .fd files for those of you who are interested in creating your own libraries of functions in assembler. C

by Graham Kinsey

Amiga Public Domain Update



ED SAUK

This has definitely been the weakest month I can remember as far as new Amiga PD programs go. I received no new Fish disks this month, and I wasn't able to get any of the new AMICUS disks I was expecting last month.

Instead, however, there is a very important sidebar attached to this month's column. The time has finally arrived when I can discuss the Amiga virus after seeing what has happened in the Amiga community. So be sure to read this carefully (and if you don't know what a virus is, then skip the new Amiga PD programs for now and proceed immediately to the sidebar!).

Since I didn't receive any new Fish or AMICUS disks this month, I have noted the program's AmigaZone download file number off of PeopleLink (this doesn't mean that it isn't on PeopleLink if no file number is given, simply that I obtained it somewhere else), so those of you who have access to PeopleLink can quickly obtain this file. I will continue to do this in subsequent columns. When a public domain program has been classified as shareware, this is also mentioned with the suggested amount.

APong: by Olav Sylthe and Geir Drangsland

If you are looking for classic games for your Amiga, you can't get any more classic than this version of the first video game, Pong. You can play in two-player mode, although one person has to use a mouse while the other uses a joystick.

FPedit: by Brett Lathrope
(AmigaZone file #10474; Shareware: $5)

This compiled AmigaBASIC program allows you to design your own maps for the commercial tank game *FirePower* from MicroIllusions. You can not only create different combinations of the standard terrain and buildings that appear on the default maps, but also introduce factors that don't happen in the supplied maps, like multiple garages, indestructible four-way bunkers and multiple first aid stations. This program does write on the original *FirePower* disk, so you may not want to use this without a backup of the *FirePower* disk.

Help!: by Jeff Lavin (Shareware: $10)

This program will bring up a help file on the Workbench screen. It has four built-in help files covering AmigaBASIC, AmigaDOS, Ed and an ASCII chart. It also has a built-in calculator with programming support. You can also create your own help files. The window is only 26 characters wide, which provides for a small amount of information at a time, but makes for a more manageable window (so it won't block too much of the screen).

Planet: by Russell Leighton (AmigaZone file #10072)

If you're looking for a special effects graphics generator, Planet may interest you. Planet will read in any IFF picture (including HAM), wrap it around a user-defined sphere, and save the output as an interlaced HAM picture. Planet simulates a light source, and will continuously modify the palette for best results. Many parameters can be re-defined at run-time.

Unix Windows: by Michael McInerny (AmigaZone file #10267)

This is a Unix Windows terminal emulation program that will allow you to hook up with a host machine running Unix.

Warp: by MAAD

This is an archiver that works with the tracks on a disk (similar to Tracker, reviewed in the August 1987 installment of this column). The big difference with Warp is that it will compress each track, making much smaller files than Tracker will. Warp can also bypass AmigaDOS and perform low-level MFM reads and writes.

Intro: by J.L. White (AmigaZone file #10158; Shareware: $10)

This is a demo creator called The Introducer, which allows you to create your own demos comprised of any lo-res IFF picture, digitized sound and text which The Introducer will scroll across the screen. You can choose to scroll the text across the top, center or bottom of the screen. If you want you can use an external sound player (like Mark Riley's Play).

Muncho: by Andrew Werth (AmigaZone file #10256)

If your Amiga environment needs a little spice, here's something to perk it up. Muncho will play a digitized sound every time you insert a disk or remove one from a floppy drive. The sound files are external and can therefore be replaced.

Ami3270: by David Jenkins

Here is a IBM 3270 terminal emulator program written in assembly language.

BAD: by Mark Hellman (AmigaZone file #10549)
This demo of a commercial program claims that by reorganizing the information on a floppy disk, it can improve the access time of any floppy disk by four to ten times. The commercial version also has a speed-up program for hard drives, plus a couple of other programs.

Cls: by David Czaya
A simple clear screen command. This command uses the arp.library that is part of ARP (AmigaDOS Replacement Project, reviewed in the April 1988 installment of this column). Therefore you must have ARP installed in order to use this command!

Mogri: by John Lockhart
Mogri allows you to easily port text files between Amigas and MS-DOS computers. It will take care of such things as end-of-line codes, striping high bits, convert tabs to spaces, chop extra long lines and eliminate control characters.

Fix_PPage_Font: by Ed Scherer (AmigaZone file #10543)
If you own the desktop program *Professional Page* by Gold Disk, you may be perturbed to find out that some of the fonts included cannot be used with other programs. Fix_PPage_Font will take care of this problem.

Undelete: author unknown
This command will allow you to recover a file that you accidentally deleted, as long as you can remember the name of the file. Four different versions of the program are included, which will copy the recovered file to one of the four possible devices (DF1:, RAM:, VD0: and VDK:).

Next month marks the first anniversary of this column. Therefore, I will be doing something special, namely giving out my awards for the best Amiga PD programs covered in the past year. (I know most people do these kind of awards at the end of the year, but besides the fact that this column premiered in July of 1987, the summer seems like a good time to give out such awards, since most people have some free time on their hands and therefore can find the time try out some of these programs).

I should also have some new Amiga programs (assuming the awards section doesn't take up too much space), but I won't try to guess whether it will be feast or famine next month.

As always, I can be reached on the Amiga Zone on PeopleLink (ID: G KINSEY), or on the IDCMP BBS (617-769-8444, 8p.m.-8a.m., addressed to SYSOP).

If you have written a public domain/shareware/freely distributable program, or have obtained one that you think is worth mentioning to all Amiga owners, then please attempt to contact me via the above contacts or through *Commodore Magazine.* See you next month.

Fish disks: *For a catalog, send a SASE and four loose stamps, or $1 to: Fred Fish, 1346 W. 10th Place, Tempe, AZ 85281.*

AMICUS Disks: *$7 per disk, or send $1 for a catalog to: PiM Publications, P.O. Box 869, Fall River, MA 02722.*

For information on PeopleLink and the AmigaZone, call: (800) 524-0100.

The Amiga (SCA) Virus

There is a dangerous class of programs that plagues the computer world in general, but until recently never appeared in the Amiga community. I'm talking about the three different types of destructive programs known as viruses, Trojan horses, and worms. Unfortunately for all Amiga owners worldwide, our previously undefiled software library has now been tainted by the presence of a virus. Just what is a virus anyway? Well, the reason it is called a virus in the first place is due to it primary function: to automatically duplicate itself to other disks, and by extension to other computers and computer users without any purposeful action from the user whose machine and disks are infected with the virus.

This in contrast to other destructive programs like Trojan horses, which depend on unaware users to spread their destructive code for them. Usually computer viruses attach themselves to host programs (just like organic viruses are spread via living hosts), and when the program code is executed the virus wakes up and attempts to spread itself. The secondary part of a virus is some action that is written by the virus creator. This could be as harmless as a simple message displayed on the user's screen, or as harmful as the virus preforming a reformat of your floppy or hard disk.

The virus that has infected the Amiga community is known as the SCA Virus, created by the Swiss Cracking Association, a European pirating organization. Unlike most viruses, the SCA

Virus does not spread by attaching itself to normal programs. Instead it replaces the boot blocks on an Amiga disk. Although most Amiga users probably are aware of the existence of the boot blocks (I say blocks since there are two 512 byte disk blocks that make up the Amiga boot block, located at sectors 0 and 1 of track 0, side 0 of an Amiga disk), but most don't know that the AmigaDOS initialization code that lies on the boot blocks takes up only a fraction of the 1024 bytes available on those two disk sectors. The SCA Virus spreads by erasing the present code on the boot blocks, and writing its own code into the boot blocks. Since the SCA Virus code includes the AmigaDOS initialization code, a disk infected with the SCA Virus will boot normally, and the user will not notice that his computer is infected by the virus. As the computer boots, the SCA Virus copies itself to memory, and wakes up. The Virus will now attempt to copy itself to other disks. However, the only time it actually infects another Amiga disk is when you boot off another bootable disk after pressing the Amiga's warm boot sequence CONTROL-AMIGA-AMIGA.

You may be thinking the CONTROL-AMIGA-AMIGA sequence would kill the SCA Virus since the memory is cleared. Are you aware of the ability of the various RAM disk devices (like ASDG's Recoverable RAM Disk) to survive a warm-boot? Well, the reason those RAM disks can keep their contents during a warm boot is the same reason why warm booting the Amiga will *not* kill the SCA Virus if it is in memory. Instead, each time you warm boot your machine with the SCA Virus in memory, it will attempt to write itself to the boot blocks of the disk.

Avoid the most likely sources of the virus in the first place—stay away from all pirated software!

Eventually, after it has copied itself a certain number of times, the SCA Virus will notify you that you are infected. Then when you re-boot, you will see the following message:

Something wonderful has happened. Your Amiga is alive!!! and even better some of your disks are infected by a Virus. Another masterpiece of the Mega-Mighty SCA.

Now this message is the only "action" that was programmed in by the creator of this virus. It was not meant to be a destructive virus. However, the virus can be fatal. The lethal part of the SCA Virus comes from the fact that it writes itself onto the boot blocks, destroying what code was originally there. Of course if the boot blocks contained just the standard AmigaDOS code, no harm has been done. However, many commercial programs (especially games) use custom boot blocks as part of a copy-protection scheme. If the SCA Virus should happen to destroy the custom code present on those boot blocks, then the program disk will not boot successfully, and your copy will be *destroyed!* This is the reason why the SCA Virus should be feared like the plague (no pun intended).

So now that you know what the SCA Virus is, here's how to get rid of it if you have become infected. If you think the virus is currently in memory, just turn off your Amiga, and wait at least five seconds before turning it back on (so that you can give the capacitors plenty of time to lose their charges).

There is also a second method of removing the SCA Virus when it is in memory, which was added by the author as a backdoor. As soon as you warm-boot the Amiga, hold down the left mouse button. If the screen suddenly turns green and remains green for several seconds, that tells you that the SCA Virus was present in memory and has been removed.

As for removing the SCA Virus from an Amiga bootable disk, simply use the AmigaDOS INSTALL command to erase the SCA Virus code and replace it with the standard boot code. Of course, you should definitely not use INSTALL on a disk that has a custom boot block in the first place, since once the custom boot code has been destroyed by the virus, you can't salvage the program anyway (immediately return the disk to the dealer or manufacturer, and *make sure you tell them it has been infected with the virus).*

Hopefully you haven't been infected by the SCA Virus. In that case, you are probably worried most about stopping the virus before any damage is done. First of all you can always hold down the left mouse button as mentioned above, which will warn you of the virus infecting your Amiga. But *the* program which you must get immediately in order to check each and every disk is VirusCheck, written and maintained by Bill Koester of Commodore.

The latest VirusCheck is version 1.9, reviewed in last month's "Amiga Public Domain Update." VirusCheck will check both an Amiga disk and your computer's memory for the presence of the SCA Virus. The extremely important feature added to VirusCheck 1.9 is that in addition to checking for the SCA Virus in particular, VirusCheck can examine the boot blocks of a disk, and tell you whether the code on the disk is the standard AmigaDOS code or not. This is vital in that it allows you to look for *any* virus stored on the boot blocks, not just the SCA Virus (more on the future later). You can also use any disk editor, like DiskX and NewZap to examine the actual contents of the boot blocks, although I would only recommend you use this to verify what VirusCheck has already told you about the disk.

Detection should go hand in hand with prevention. There are many things you can do that can reduce the chance of your ever getting the SCA Virus in the first place. The first, and perhaps most effective action is to flip the write protect switch on every disk you have to the protected position. Although the SCA Virus can thwart the Amiga trying to erase it from memory during a warm-boot (via software instructions), it can never overcome the write protect switch on a floppy disk (which is a hardware mechanism and can not be overridden without physical modification to the drive itself).

VirusCheck will check both an Amiga disk and your computer's memory for the presence of the SCA Virus.

Of course, if you happen to be able to boot off your hard drive (those of you who own Comspec's latest hard drive already have this feature available), you have no way to protect your hard drive, so you must religiously follow all the other preventative actions you can take. I'm assuming here that most Amiga users have a favorite system disk that they usually boot off of, and then proceed to load in other programs and carry on with your Amiga activities. Obviously if you always keep this disk write-

protected, you will be far less vulnerable to the virus.

Just as important as making your Amiga environment unfriendly to a virus is trying to stay away from the virus in the first place. What I mean here is try not to come in contact with the most likely sources of the virus in the first place—stay away from all pirated software! The SCA Virus reportedly first came into the US from Europe on a pirated copy of *MouseTrap,* a commercial arcade game. I hope that this doesn't apply to any of my readers, but those don't care about things like the law now have another reason to only obtain commercial software legitimately, by purchasing it.

The lethal part of the SCA Virus comes from the fact that it writes itself onto the boot blocks, destroying what code was originally there.

Speaking of purchasing software, if you buy your software from a local dealer, then make sure that he/she is fully aware of what the SCA Virus is and how to guard against it. If for some reason your local dealer is lackadaisical about guarding against virus infection then you should only buy software from that dealer (assuming you really can't go elsewhere) if you know that the *original factory* shrink-wrap seal has not been broken. Nevertheless, even if the disk has not been infected by the local dealer, that doesn't mean that it received the virus from the manufacturer. There have been cases where commercial products have been shipped with the SCA Virus present in the boot blocks.

As far as public domain software goes, first keep in mind that unless the disk is bootable, you don't have to worry about it being infected with the SCA Virus. This means that you mainly have to watch out for things like full demo disks that are meant to be bootable. Getting disks from the established sources (i.e., Fred Fish and AMICUS) may be safer than getting disks from groups you don't know, because if a Fish or AMICUS disk becomes infected at the source, you should hear about it very quickly. This shouldn't apply if you know that the group in question is checking for the virus on each PD disk they make.

A lot of people ask me if they could possibly become infected with the SCA Virus via downloading a PD program from a bulletin board or online service. Well, if the file is stored in either the ARC, PAK or ZOO archive formats (or if there is no file archiver being used), you have nothing to worry about, since the SCA Virus is not attached to a regular disk file, and these archivers all archive files only. However, there is a danger concerning files broken up with the programs Tracker or Warp. Since both of these archivers handle disk tracks and not files, they can archive the boot block as part of track 0. So if you download a demo or other set of files stored in either of these formats, you should check them for the SCA Virus as soon as you unravel the tracks to their original state on a blank disk.

I hope this information has made you aware of what the SCA Virus is and what to do about it. However, there are at least two other important developments that I must also mention. First, once the original SCA Virus had circulated for a while, apparently somebody decided to alter its text string message. Thus, the second strain of the SCA Virus was born. However, if you have VirusCheck (version 1.2 or above) it will also check for this second strain. Of course, there certainly is a possibility that there are other strains of the SCA Virus floating around out there, which is why VirusCheck 1.9's ability to check for non-standard boot blocks is so important.

The other major development is that the author of the SCA Virus has created a protector program called "The Virus Protector." This program supposedly can not only detect and destroy the SCA Virus, but also make uninfected disks immune from the SCA Virus. I implore you *not to use this program!* First of all, Bill Koester has said that Virus Protector only works with the original SCA Virus. It is totally useless against the second strain or against any further mutations. Second, the Virus Protector does not come with any source code. If the author of the SCA Virus really wanted to help people understand how the virus and this protector program worked (to be able to better protect themselves against future viruses), wouldn't he distribute the source code in addition to the executable? (In a letter to Bill Koester, the SCA Virus author "requested" that Commodore include this protector program on every copy of Workbench 1.3, so I think that says it all!) And third, why should you trust these people?

One last thing: If you think you have been infected by a new virus or other destructive program, *please* send a disk with the destructive program to Bill Koester, Commodore Amiga Technical Support, 1200 Wilson Dr., West Chester, PA 19380. Bill can't determine what the program does if he doesn't have a copy of it, so please just don't reformat a disk with a suspected *new* virus without making it available to him first. ■

by Robert W. Baker

A Night at the RabbitJack

Explore the inner workings of the Q-Link telecommunications service with network pro Bob Baker.

I keep mentioning the multitude of hidden goodies on Q-Link that you come across if you take the time to look around once in a while. Did you know that there are cartoons online?

You might want to check out the Picture Perfect section of the Graphics Library in the public domain download library. There's a collection of T.H.E. Fox Cartoons available in the libraries from Joe Ekaitis (Joe E3). However, you'll need the Dkcompress utility from Sysop PH to view the cartoon files.

Another topic that keeps coming up is the ability to save various messages and text screens using the F3 key with the Q-Link software. If you come across a message somewhere in the message boards that you want to save, simply display the message and then press F3. The Q-Link software will prompt you for a filename to save the displayed text on disk. You'll be reminded to remove the Q-Link disk and insert another disk to receive the data.

The file created with the F3 function is a standard sequential data file that can be displayed or printed using the Sprint or Ultra utilities or loaded into your favorite word processor, etc. Once saved to disk, you can use the data however and whenever you need it.

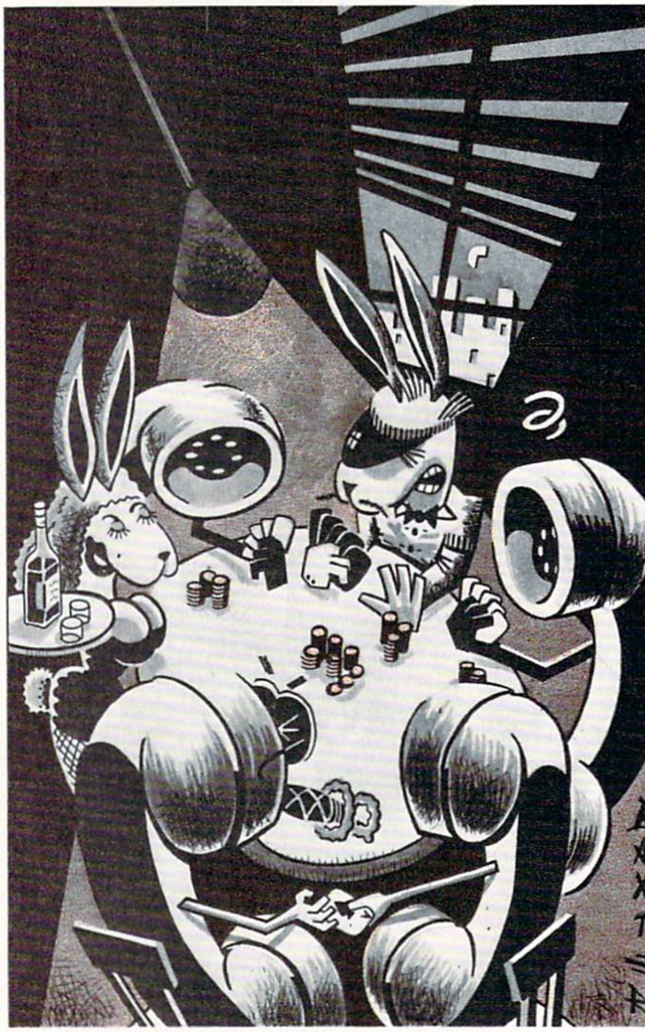
One more handy hint on saving text from Q-Link involves an undocumented feature of the F3 save function. If you enter the filename of an existing file on the disk inserted in your disk drive, the new data will be APPENDED at the end of the existing data in the file. This allows you to save a string of related messages in a single data file for instance.

The append feature of the F3 function also solves the problem of trying to save large online text files, like the reprints of this column that appear in multiple pieces. Simply display and save each segment of the article and keep using the same filename each time you save the data to disk. All the data will then be saved in a single file that can be displayed or printed intact.

The only side effect of the append function is that a small separator line consisting of colons and dashes is inserted between each chunk of saved data. If this is objectionable, the only recourse is to load the data file into your word processor and delete the offending lines. Then resave the data onto disk in the desired format.

With the passing of the first anniversary of the RabbitJack Casino in April, I thought it might be of interest to get some useful hints and inside information from the casino staff. If you haven't tried out the online Casino yet, give it a try some night. You might just have a lot of fun. The RabbitJack Casino is one of the most popular areas on Q-Link these days. In any event, here's plenty of information for the current crop of online gamblers out there:

When you're in the bingo parlors, don't worry if you forget to cover a number that was called. The computer still gives you



credit for having any number that it calls, so you don't actually have to cover any of your numbers at all. Covering the numbers is simply a convenient tool for keeping track of the game.

Don't forget that you can only take 2500 Q-Chips to any table in the Casino. At the High Stakes Poker tables these can run low really fast. Some of the players have caught on to a trick that they call "refilling" which lets them get their table balance back up to 2500 Q-chips without risking losing their seat at the table.

> RabbitJack Casino is probably the only casino that will not kick you out for using "card counting" strategies.

The trick is simply to go to the same table you are presently at. For example, say you're at table 950. When you run low on Q-Chips, select:

Leave This Table
Go To Another Table
Go To a Specific Table (then enter "950" when prompted for the table number)

You can leave the table and come back to it fast enough so that no one else can take your spot. Plus, when you get back,

you'll have 2500 fresh Q-Chips to play with (assuming you have enough in your account). By the way, this also works in any of the other games, but is most useful in the High Stakes Poker games.

If you don't have a lot of Q-Chips, it's a good idea to avoid the High Stakes games which are numbered 900 through 999. You can loose a lot in a hurry at those games.

If you don't seem to be winning much at the slots, try changing machines. If you don't want to leave the row you're in, you can go to the same row using commands similar to those outlined earlier for returning to the same table.

In blackjack, it's always a good idea to Double Down when you're dealt a 10 or 11 total. Since there are more cards equalling ten in the deck than any other, odds are pretty good that the next card you get will give you 20 or 21. Also, RabbitJack Casino is probably the only casino that will not kick you out for using "card counting" strategies or other methods that guarantee success in blackjack. If you have a method that works for you, they encourage you to use it!

Winners of the People's Choice Awards were announced at a black-tie ceremony in the Auditorium.

Remember you're only playing with Q-Chips, so if you have them to spare, don't be too concerned with whether or not your poker buddy is bluffing. Among the many who play in the Casino, surprisingly few use good betting strategies. Plus, since Q-Chips are not redeemable for prizes, most people just bet like crazy! By the way, if we could cash in our Q-Chips, Q-Link would be violating the gambling laws of many states.

If you're interested in the Casino, the best place to keep up with what's going on is the Casino Club in Just for Fun. You'll find out all about upcoming events and contests, as well as news and other information relating to the Casino. You can also post and read player messages if you have comments or questions about the Casino.

As I mentioned earlier, the RabbitJack Casino just celebrated their first anniversary, having opened to the public on April 1, 1987. The Casino Staff (QRJs) made their smash debut at the first Casino Night on June 3, 1987. There were 13 of them back then, and there will be 22 or more by the time this appears.

The QRJs are a wild, wacky and fun group who aim to please. They keep an eye on the whole place and solve any problems that might arise, while still managing to have fun. A few QRJs also sponsor their own events and special get-togethers. QRJ Jewell was the head of the PC Casino Committee, a group of QRJs who sponsors a People Connection event every month or so. They were even giving out some nice prizes too.

QRJ Fred was posting a daily trivia question in the Casino with Q-Chip prizes for correct answers. QRJ Annie was hosting Insomniac Bingo in the wee hours of the morning every Wednesday. QRJ Joy and QRJ Qwick were managing Casino Lotto using pre-specified bingo game numbers for this "Pick 5" game with Q-Chip prizes. These and other special events are constantly changing, so be sure to check the Casino Club area of Just For Fun for the latest information.

Another big special event that was happening on Q-Link at the time I was writing this was the People's Choice Awards. A special area was set up in the Software Showcase where users could vote for their favorite software packages in nine categories. The winners were announced on February 28 during a black-tie People's Choice Awards Ceremony in the Auditorium. They are:

Adventure/Role-Playing Game: *Bard's Tale II* (Electronic Arts)
Arcade Game: *Skate or Die* (Electronic Arts)
Simulation: *Gunship* (MicroProse)
Sports Game: *California Games* (Epyx)
Utility: GEOS (Berkeley)
Music Software: *Instant Music* (Electronic Arts)
Graphics Software: *geoPaint* (Berkeley)
Productivity Software: *PrintShop* (Broderbund)
Educational Software: *Where in the World is Carmen Sandiego?* (Broderbund)

Everyone who voted was eligible in a random drawing for free copies of various commercial software, Q-Link T-shirts and *free* Plus time on Q-Link. In addition, top software titles were also given away to a few lucky members of the audience during the final ceremonies. Be sure to watch for your chance to vote in next year's People's Choice Awards.

That wraps things up for this month. If you have any comments or questions or anything to share with others, you can reach me daily via E-Mail to RBAKER. Also, don't forget that reprints of past "Inside Q-Link" columns are now available on-line in the Features section of News and Information. ▣

by Shay Addams

Quest for CES

News and opinion from a leading explorer of those fantasy realms called adventure games.



After years of dreaming up perfectly logical excuses for avoiding the Consumer Electronics Show, I finally journeyed to Las Vegas in January. It turned out to be an Adventurer's Heaven, for the West Hall was packed with new games. The best-looking new role-playing game I saw on the Amiga was *Land of Legends* from MicroIllusions. A 64 conversion is planned and may be out by the time you read this.

Initially it resembles *A Bard's Tale*, showing 3D graphics in a window on the left while you explore the maze. But bump into a gang of monsters, and the perspective shifts to a semi-overhead view seen from an oblique angle. All monsters and party members are portrayed with full-figured characters that wage animated combat. At the bottom of the screen is a text parser like the kind in Infocom games, which enables you to solve logical puzzles by typing in commands.

After getting killed 47 times in that fantasy world, I went diving for danger in another Amiga game, *Return to Atlantis*. This one has been haunting us for an eternity (it was first set to ship over a year ago), so no one at Electronic Arts laughed when I speculated that Jacques Cousteau would find Atlantis before they released the game. It's a one-character role-playing game with animated characters similar to those in the *King's Quest* series from Sierra. A submarine serves as your base of operations while you complete eight "save the world"-type scenarios. Conducted from menus, character interaction is as important as defeating the undersea monsters. The voice synthesis was easily the best I've heard from an Amiga, so good I could detect one character's Scottish accent.

More Amiga games were on display at the Omnitrend booth. "The Serayachi Campaign" is a scenario disk for *Breach*. They also demonstrated *Paladin*, a fantasy game that uses the *Breach* system of tile graphics but adds teleports, magic and a wide assortment of weapons and artifacts. Your *Breach* character may be imported, or you can roll up a new one. Up to ten party members accompany you on the various quests, the long-range goal of which is to achieve knighthood for your main character. *Universe III: The Traveller's Return* will be the first game in that series of animated role-playing games to be converted for the Amiga (but not the 64). It's a science fiction saga with a fine interface, lots of character interaction, combat and trading.

Sierra's Surprises

A big surprise emerged from a chat with the Sierra team—the programmers of *Ancient Art of War* have written their first animated adventure, which is also Sierra's first such game without a parser. It unfolds in a futuristic New York City that has been taken over by aliens. You play the part of an "anti-hero" who works for them, tracking down rebellious humans. The game employs some of the aerial view displays used in *Police Quest* but doesn't have animated phases like driving that police car. Ken Williams told me they learned that most adventurers didn't like the action aspect of *Police Quest*, so you won't have to worry about that in future games. And Roberta Williams revealed that *King's Quest IV* will be the first of the series in which you play the role of a woman: it's subtitled *Perils of Rosella* and will be out this fall. Sierra's also got a western called *Gold Rush* on the way. These are strictly Amiga games.

Wasteland and *Bard's Tale III*

Co-written by Ken St. André and Michael Stackpole, and programmed by Interplay's Alan Pavlish, *Wasteland* has practically become a legend before its time simply because it has been "on the way" for so long. The idea is that Reagan's SDI doesn't work, so nuclear war turns the American Southwest (also the stomping grounds of St. André and Stackpole) into a playground for mutant monsters and rampaging robots. It's the kind of game whose goal is discovered as you explore the realm. Whoops! I meant to say "as you explore the *land*." (I have to keep reminding myself this is not a "fantasy" role-playing game but a "science fiction" role-playing game.)

> *Wasteland* has practically become a legend before its time simply because it has been "on the way" for so long.

The team consists of seven members, who blast away with machine guns and lasers instead of swinging swords and flinging spells. Some are NPCs (non-player characters) who may independently perform certain actions, such as elements of com-

> With each new installment in the series, *Ultima* leaps ten leagues ahead of the imitators.

bat. When traveling by land, your view is that of a bird; interiors of towns and buildings also appear from this familiar perspective. On the left side of the screen 3D monsters are presented in the style of *Bard's Tale*. I saw this on an Apple, so the graphics, animation and sound effects should be ramped up considerably for the 64—even more for the Amiga. (EA has a good track record in this area.) The original storyline and amusing character interaction make *Wasteland* a standout.

The story for *Bard's Tale III: Thief of Fate* was also written by Mike Stackpole. Seems the Mad God, Tarjan, has leveled the town of Skara Brae, so you'll travel through nine dimensions in time and space to seek him out, often finding clues in Stackpole's flowing text passages. A new artist devised all new monsters, and the spot animation is remarkably improved.

You can finally save the game anywhere, even inside a dungeon. And those dungeons offer more variety, for instead of being a uniform size they range from 4x4 to 20x20. Lots of new spells have been added, including one that's like ZZGO but which *must* be learned in the game (you can't just read about it in a clue book, then cast it). It introduces two new magic classes—Geomancer and Chronomancer—and supports female characters for the first time. Thief is finally useful in this series, for only he can identify items without paying a fee. "In difficulty it's comparable to the first game," Fargo explained, "but easier in puzzles and balance than *Destiny Knight*. It's the most balanced and offers the most to do of all three—and it has a great ending."

Ultima V, A D & D, Questron II

The latest chapter in the saga of Lord British—*Ultima V: Warriors of Destiny*—demonstrates why Richard Garriott doesn't have to worry about other programmers churning out all those *Ultima* clones. With each new installment in the series, he leaps ten leagues ahead of them. *Ultima V*'s spot animation is unparalleled in the history of role-playing games, a high-tech high water mark. I especially appreciated one of several changes to the combat system: in previous *Ultimas* the monsters could fire diagonally at you, but you were restricted to firing only in the four compass directions. Now you can aim by moving a cursor over your intended victim—anywhere on the board—who remains targeted even if he moves.

SSI was showing an early peek at *Advanced Dungeons and Dragons* on the 128. It's being programmed by Keith Bors and Paul Murray, who did *Wizard's Crown*, and features the best animation I've seen in an SSI game. The first title in the series is *The Pool of Radiance*. A 64/128 version is set for June with an Amiga version due by winter. (SSI is also doing an arcade version of *A D & D* for the 64, plus a *Dungeon Master's Utility Program* for the 64 and Amiga.)

Questron II sends you back through time to prevent the Evil Book of Magic (from the first game) from being created. One new feature shows monsters small in the distance and growing larger as they approach. Auto-mapping complements *Questron*'s familiar and convenient interface. I saw it on the 128, and an Amiga version should be out by now.

InfoComics

Infocom announced a new line called InfoComics, which are being done in conjunction with Tom Snyder Productions. InfoComics have no puzzles or goals. Instead of changing the story by interacting with things or people in it, you change your perspective by assuming a different character's persona at key intersections of the plot.

Two more major differences: Graphics are in (but kept simple so more can be crammed onto the disk), and the parser is out (a four-key interface acts like a remote control, allowing you to fast-forward, rewind, change characters and save the game.) The first three feature comic book themes and will even be sold in comic book and toy stores. They'll go for $12 each (64 only) and should be good for a few hours of fun. (Whether hard-core Zorkers will enjoy them is another matter.)

The line is designed to attract a new audience, not to satisfy those already addicted to text adventures. Don't worry, Infocom has plenty of those in store for '88, games like their new *Sherlock Holmes*. Infocom also plans to follow up on the successful *Beyond Zork* with more titles that mix text-based puzzles with the combat, magic and character development of role-playing games.

Clue of the Month

Here's a single clue that will help you solve 50 games—pick up a copy of *Quest for Clues*, published by Origin Systems. The solutions were done by members of the QuestBusters Guild and provide coded answers and maps for the entire *Phantasie* series, many Infocom games and most adventures and role-playing games from 1986–87. ■

Continued from page 14

```
220 DATA 2,64,0,0,0,0,12,48,0,0,0,0,
    60,60,0,0,3,128,252,63,1,192,31,
    96,254,127
230 DATA 6,248,119,57,255,255,156,238,
    255,31,255,255,248,255,127,31,255,
    255,248
240 DATA 254,31,56,254,127,28,248,0,
    96,248,31,6,0,0,128,48,12,1,0,0,0,
    8,16
```

European Siren: This program for the 64 or 128 makes a sound like those sirens you hear in European spy movies. It's great for using as a subroutine or for showing someone the amazing sound capabilities of Commodore machines.

Variable N, in line 110, controls the number of "wee-whoos" before the sound shuts off.

Michael L. Gatto
Los Angeles, CA

```
100 REM EUROPEAN SIREN - MICHAEL GATTO
110 N=5   :REM NUMBER OF SIREN BLASTS
120 S=54272:V=S+24:AD=S+5:SR=S+6:W=S+4
130 POKE V,15:POKE AD,0:POKE SR,240
    :POKE W,33
140 FOR J=1 TO N
150 POKE S,52:POKE S+1,43
    :FOR D=1 TO 300:NEXT
160 POKE S,75:POKE S+1,34
    :FOR D=1 TO 300:NEXT
170 NEXT J
180 POKE W,32:POKE V,0
```

Numbers, numerals and bases: Everybody knows that computer math uses base 2 arithmetic, and that human math uses base 10. Many computer people are also familiar with hexadecimal math, or math using base 16.

To understand these things in any depth, you need to thoroughly understand several simple concepts.

The first of these is *number.* Number is an abstract concept having nothing to do with digits, bases and the like. Your fingers and my toes have little in common except their number, which in English we call "ten." In French, that number would be called *dix,* while in German it would be called *zehn.*

The number ten, so closely allied with your fingers, is also associated with the number of players in a basketball game—two teams of five each, for a total of ten players.

Although number is an abstract concept, we can make it concrete by assigning a symbol to it. The most common symbol for the number ten is 10. Interestingly, the English, French and Germans all use the same symbol for that number, in spite of their very different words for the same thing. The ancient Romans, who called that number *decem,* used a different symbol, X.

Number symbols, no matter how they are written, are called *numerals.* The Roman numeral for the number ten is X, while the English/French/German schoolboy's numeral for the same thing is 10. Notice that the numeral is not the number itself, but only a symbol for the number.

When we speak of binary, decimal and hexadecimal, we aren't speaking of numbers at all, but of systems of *numerals.* In the binary system of numerals, there are only two symbols: 0 and 1. It's called the binary system from the Greek root *bi-*, meaning two. The decimal system of numerals, taking its name from the Greek root *deci-*, has ten different symbols, the familiar digits 0 through 9. The hexadecimal system of numerals has sixteen different symbols, consisting of the ten digits 0-9, plus the letters A, B, C, D, E and F.

When we write down the numeral for the number of your fingers, we write 10, 1010, A or X, depending on whether our numerals are from the decimal, binary, hexadecimal or Roman systems. It's a potentially confusing situation, but if you understand what's presented here, it won't be confusing to *you!*

The number of different symbols in a numeral system are referred to as the *base* of the system. (Since Roman numerals lack the regularity of the other systems, the Roman system really doesn't have a base.)

While decimal, binary, hex and Roman are the most common numeral systems by far, there are many others. The only one you're likely to see outside of math class is the *octal* system, which uses base 8, and is sometimes used in computer work.

Usually, the basic symbols in these systems consist of all of the digits 0-9, plus as many letters from A–Z as are necessary. By using some or all of those 36 symbols, we could create a numeral system with any base from 2 to 36.

Now that you understand that *numbers* are abstract qualities of collections of things, that *numerals* are symbols for different numbers, and that different numeral systems can be constructed on different *bases,* you're ready for the next two items.

Louis F. Sander
Pittsburgh, PA

Universal Base Converter: This program, for 64 or 128 mode, will convert a numeral from any base to any other. It works only for bases from 2 to 36, but that shouldn't interfere with any practical use.

Art Skiles
Huntington, IN

```
100 PRINT"[CLEAR,DOWN] UNIVERSAL BASE
    CONVERTER - ART SKILES"
    :ER$="[^2]?"
110 N$="":INPUT "[DOWN2]
    NUMERAL TO CONVERT";N$
    :IF N$="" THEN END
120 INPUT"[DOWN,SPACE2]
    FROM BASE (2-36)";F
    :IF F<2 OR F>36 THEN PRINT
    TAB(20);ER$:GOTO 120
130 INPUT"[DOWN,SPACE4]
    TO BASE (2-36)";T:IF T<2 OR T>36
    THEN PRINT TAB(20);ER$:GOTO 130
140 X=0:FOR Z=1 TO LEN(N$)
    :A=ASC(MID$(N$,Z,1))
150 B=A+48*(A>47 AND A<58)+55*(A>64
    AND A<91)+85*(A>96 AND A<123)
160 IF B>=F THEN PRINT "[DOWN]
    ERROR IN NUMERAL TO CONVERT!"
    :GOTO 110
170 X=X*F+B:NEXT Z:CN$=""
180 B=X-INT(X/T)*T:X=(X-B)/T
```

```
190 A=B-48*(B<10)-55*(B>9)
200 CN$=CHR$(A)+CN$:IF X THEN 180
210 PRINT "[DOWN] CONVERTED NUMERAL
    : ";CN$:GOTO 110
```

Dec-Hex and Hex-Dec Converters: The accompanying listing includes two one-line routines for converting from hexadecimal to decimal or vice versa. While the routines themselves are in lines 160 and 230, I've included other lines that allow you to exercise and prove the routines.

To convert from decimal notation to hexadecimal just run the program. To convert from hex notation to decimal just RUN 200. To add these routines to programs of your own just extract the appropriate lines.

The program only works for numbers from 0-65535 decimal, or 0000-FFFF hex. Hex numerals must always be entered with four places, so use leading zeroes if you need them.

A.W. Grym
London, England

```
100 REM * DEC-HEX & HEX-DEC CONVERTERS
110 REM * CREATED BY LOUIS F. SANDER
120 :
130 REM DEC-HEX CONVERTER (0-65535)
140 INPUT "DEC NUMERAL (0-65535)";D
150 REM NEXT LINE DOES THE CONVERSION
160 H$="":D=D/4096:FOR J=1 TO 4:D%=D
    :H$=H$+CHR$(48+D%-(D%>9)*7)
    :D=16*(D-D%):NEXT
170 PRINT "[SPACE10]HEX NUMERAL: ";H$
180 END
190 :
200 REM HEX-DEC CONVERTER (0000-FFFF)
210 INPUT "4-DIGIT HEX NUMERAL";H$
220 REM NEXT LINE DOES THE CONVERSION
230 D=0:FOR J=1 TO 4:D%=ASC(H$)
    :D%=D%-48+(D%>64)*7:H$=MID$(H$,2)
    :D=16*D+D%:NEXT
240 PRINT "[SPACE8]DEC NUMERAL:";D
250 END
```

Start Address Finder: Have you ever forgotten the SYS address of a machine language program? If you have, this little program may save the day. Put a disk with your machine language program into drive 8, then run this program and enter the name of the machine language program.

This program will look up the ML program's starting address and print it on the screen. The starting address is the lowest memory location used by the machine language program; that's usually the address you SYS to start the program.

Kennet Carroll
Lanett, AL

```
10 REM START ADDRESS FINDER -
   K.CARROLL
20 INPUT"[SPACE2]FILENAME";F$
30 OPEN 2,8,2,F$:GET#2,A$,B$:CLOSE 2
40 PRINT"START ADDR=";
50 C$=CHR$(0):PRINT ASC(A$+C$)
   +256*ASC(B$+C$)
```

64 Disk Error Reader: If you're getting tired of those mysterious blinking lights on your disk drive, the accompanying program is just the thing you need.

When run, it puts a machine language program into the tape buffer, where it stays until you use the tape drive or reset the computer. When your disk light blinks, you call the machine language program by typing SYS 830. It responds by turning off the blinking light and printing out the message from the disk error channel.

If you like, you can add a NEW to the end of the BASIC program; then it will remove itself from memory as soon as the machine language is in place. By the way, the machine language is completely relocatable—if you know about such things, you can put it somewhere else in memory.

Faisal Akbar Ali
Dubai, United Arab Emirates

```
10 PRINT"[CLEAR,DOWN]64 DISK ERROR
   READER - FAISAL AKBAR ALI
20 FOR J=830 TO 868:READ K:POKE J,K
   :CS=CS+K:NEXT
30 IF CS<> 5736 THEN PRINT"ERROR IN
   DATA STATEMENTS!":STOP
40 PRINT"[DOWN]AFTER THIS HAS BEEN
   RUN, SYS830 STOPS
50 PRINT"THE DISK LIGHT BLINKING AND
   DISPLAYS
60 PRINT"THE DISK ERROR MESSAGE.
   [DOWN2]"
61 DATA 169,015,168,162,008,032,186,
   255
```

```
62 DATA 169,000,032,189,255,032,192,
   255
63 DATA 162,015,032,198,255,032,207,
   255
64 DATA 201,013,240,005,032,210,255,
   208
65 DATA 244,032,231,255,076,204,255
```

64 F7 Apostrophe Key: When I'm using *Commodore Magazine's* Entry Program, I find it very awkward to press SHIFT and the 7 key to get the apostrophe before the checksum.

To make program entry a little bit quicker, I wrote this short machine language program that transforms the F7 function key into an apostrophe key. Happy typing!
Brian Evans
Bay Springs, MS

```
100 REM 64 F7 APOSTROPHE - BRIAN EVANS
110 REM MAKES 64'S F7 KEY PRINT AN
    APOS
120 FOR J=50060 TO J+36:READ K
    :POKE J,K:NEXT
130 SYS 50060
140 DATA 120,162,153,160,195,142
150 DATA 020,003,140,021,003,088
160 DATA 096,072,138,072,152,072
170 DATA 165,215,201,136,208,005
180 DATA 169,039,032,210,255,104
190 DATA 168,104,170,104,076,049
200 DATA 234,000,000,000,000,000
```


128 DOS Shell: Making a working copy of the 128 DOS Shell program is a lot more difficult than it should be, since there's some autoboot code on Track 1, Sector 0 that can't be copied in the usual way.

The way to make a copy is to use the DOS Shell to copy the 1571 Test/Demo disk onto a blank disk. It will copy in double-sided format.

Now reformat the disk you just made, being sure *not* to specify a new ID code. The drive will spin for a while, and when it stops, use the DOS Shell's File Copy option to copy DOS Shell from the original disk to your new one.
Frank Klein
South Elgin, IL

Printers and commercial software: Finding programs that are compatible with your printer can seem like a real chore, since many programs like *Print Shop* and *Jingle Disk* list only a handful of compatible printers. Just because your printer isn't listed doesn't mean it won't work.

I own a Seikosha SP-110-VC that works fine with many programs that don't list it in their instructions. When in doubt, I buy the program, since one of its many printer combinations is bound to work with mine.
Neal Pynenberg
Kaukauna, WI

More DPS1101 printwheels: I've bought and tested these wheels for my Commodore DPS1101 daisy-wheel printer: Montgomery Wards typewriter department carries JUKI monoplastic printwheels priced at $16.99 each. Their Mini Majestic 12/15 is the best type size I've found. Venture's typewriter department carries Royal/Triumph Adler monoplastic printwheels for Royal Alpha 2001, Adler Satellite II and Olympia Portable Electronic typewriters. For another $16.99, their Elite-Modern 10/12 pretty well rounds out my printing needs.
Walter J. Upham
Kansas City, MO

MPS1000 in NLQ: Here's how to put this popular printer into NLQ mode without having to set the DIP switches. First, turn on the printer and adjust the paper. Then, in direct mode, enter:

OPEN 4,4,7 : PRINT#4,CHR$(31);CHR$(141); : CLOSE4

Next load your word processor and the document to be printed. The output will be in NLQ mode.

Of course, many word processors include some method of sending printer setup codes, either from the document or from the word processor itself. If yours is one of them, sending the two CHR$ codes may be enough to do the trick.
R.V. Taylor
Little Rock, AR

New life for old ribbons: When your cloth printer ribbon can no longer make clear, dark characters, don't throw it away. You can still use it to print five or ten pages by putting your printer into near letter quality (NLQ) mode, if your printer has such a mode. In NLQ mode, each character is struck twice with a slight offset. With a good ribbon, this gives you exceptionally black characters that lack most of the "dot-matrix look." With an almost-

dead ribbon, it gives you legible printing instead of something too light to see.
Chuen K.
McPherson, KS

Changing screen and character colors: If you're writing a program that allows the user to change the screen and/or character colors, the two accompanying programs can be very useful. When executed, either line advances the appropriate color by one number. The good part is that the screen and character colors are never allowed to be the same!

Basically, a simple trick of computer logic is used to check the changed color and keep it from being the same as the other one. Don't worry about how it works—it just does!
Kermit R. Woodall
Glen Allen, VA

```
100 REM CHARACTER COLOR - KERMIT
    WOODALL
101 REM ADVANCES THE CHARACTER COLOR
102 REM BUT WILL NOT MAKE IT THE SAME
103 REM AS THE SCREEN COLOR.
104 :
110 POKE 646,(PEEK(646)+1 AND
    15)+ABS((PEEK(53281)AND
    15)=(PEEK(646)+1 AND 15))
```

```
100 REM SCREEN COLOR - KERMIT WOODALL
101 REM ADVANCES THE SCREEN COLOR, BUT
102 REM WILL NOT MAKE IT THE SAME AS
103 REM THE CHARACTER COLOR.
104 :
110 POKE 53281,(PEEK(53281)+1 AND
    15)+ABS((PEEK(53281)+1 AND
    15)=(PEEK(646)AND 15))
```

Finding syntax errors: When you're stumped by a syntax error in a line that looks error free, try the following:

1. Change character sets with SHIFT/COMMODORE. This finds many hard-to-see typing mistakes, such as the letter O entered instead of zero or SHIFT/L instead of L.

2. Insert spaces between keywords and variables. This makes the line easier for you to proofread and makes it easier for the computer to interpret. The computer thinks TANDF means TAN DEF, even if you think it means T AND EF.

3. Look for reserved variables used incorrectly; also look for key words used as variables. S=ST is fine, but ST=S causes an error; FB=X works, but FN=X does not.

4. Get a second opinion. Compare your syntax against examples in the manual, or ask a friend to look at the problem line.
Nicholas G.D. Old
Baltimore, MD

Detecting disabled STOP key: If you've disabled the STOP key, you can still detect it and have your program take the appropriate action. The secret is to use a GET statement to check for a CHR$(3), which is the character generated by the disabled STOP key.
Skynyrd
Q-Link

Q-Link rosters: When I'm in a People Connection room, I list the people in the room and leave it at the top of the screen while I talk.

Between that list and the HI and BYE lists, I know who is there all the time. When the accumulated HIs and BYEs have become too numerous, I re-list the people in the room.
Phrankie01
Q-Link

Word processor justification: Like many word processors, my *geoWrite 2.0* offers both word wrap and right and left justification. But when a long word on one line is wrapped to the beginning of the next line, large and unsightly spaces are created when the first of these is justified. The adjustment of these deficiencies was annoying and time consuming until I discovered a simple procedure to eliminate the problem.

As I type and approach the end of the line, I note any long word that would normally be word-wrapped. I type the word through its initial syllables until I reach a suitable hyphenation point near the end of the line. Then I type a hyphen and a space, followed by the rest of the word. The space triggers the wrap function and the word is appropriately divided and hyphenated. The justification looks much better than it did the other way.

Initially the procedure may seem awkward, but it soon becomes automatic, and the results are well worth the effort.
Charles W. Seager
Address Unknown

64 GRAPHICS CONTEST



Our third annual Commodore 64 Graphics Contest drew over 200 entries. Winners were selected for originality, creativity and best use of the Commodore 64's graphics capabilities.

Grand Award: $500

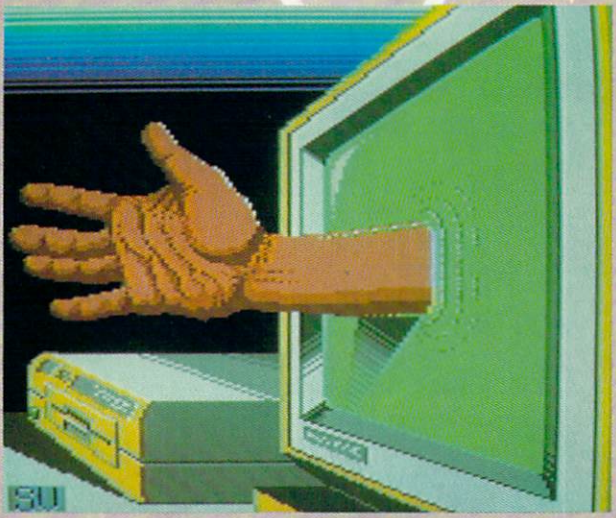
Two Birds
by Phillip J. Barrows, Pacifica, CA
Koala Pad

RUNNERS UP

$100 each



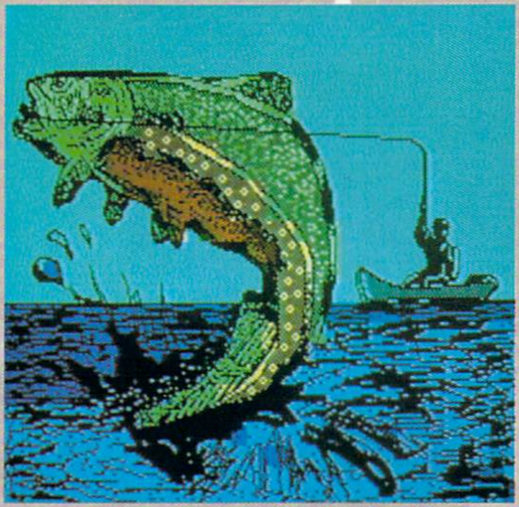
Cat
by Nancy Kowall,
Pasadena, CA
Koala Pad



Hand
by Steven Vitale, Runnemede, NJ
Koala Painter with *Koala Pad*



Ocean
by Thomas Mills, Inglewood, CA
Advanced OCP Art Studio

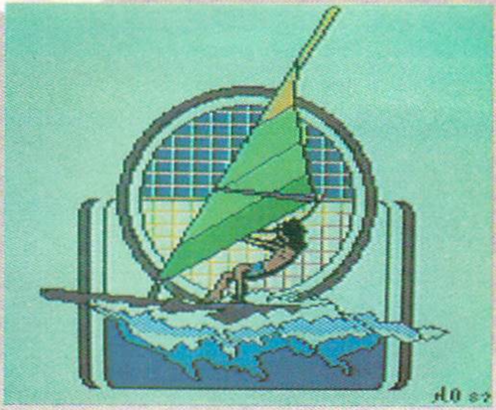


Gawn Fishin
by Michael Zwahlen,
Davison, MI
Flexidraw 5.5



A Damsel Emerges
by Wayne Schmidt, New York, NY
Artist 64

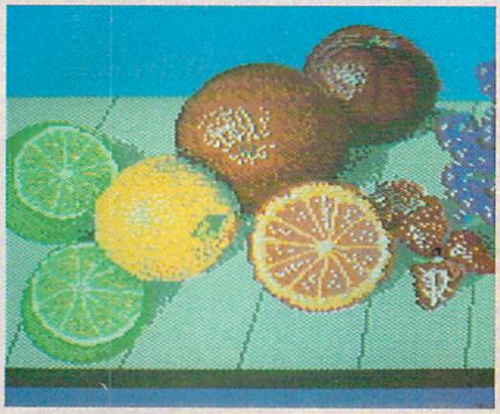
HONORABLE MENTION



Sensation of Liberty
by Michel Ouellet,
Baie-des-Sables, Quebec
Koala Painter



Simple Beauty
by Herman R. Scheck, Federal Way, WA
Micro Illustrator



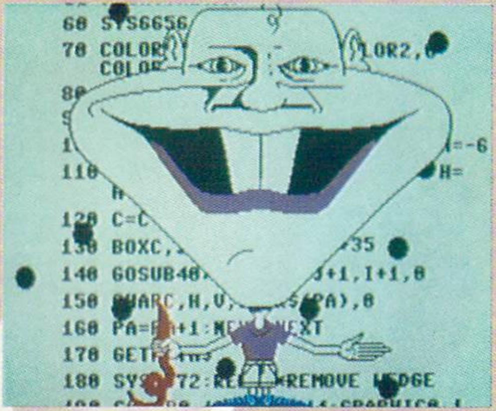
Fruit
by Jeremy Wells,
Tualatin, OR
Koala Pad



Hallway
by Rance Rizzutto, Tigard, OR
Koala Pad



Fzzzt!
by Aaron Averill,
Tigard, OR
Koala Painter



I Found the Bug
by Dane A. Boren, St. George, UT
Doodle!



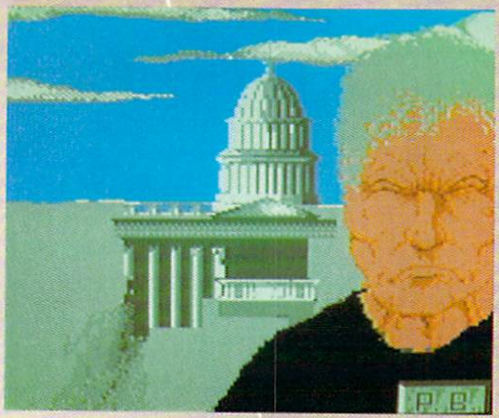
Art Gallery
by Larry Snodgrass,
Bellevue, KY
Koala Painter



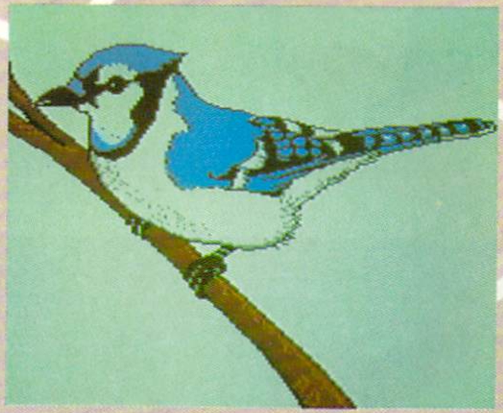
Eagle
by Keith Coleman,
Sulphur, LA
Doodle!



Thanatos
by Blaine P. Borgia, Tigard, OR
Koala Pad



Artist's Block--Based on a True Story
by Phillip Bruce, Savannah, GA
Koala Pad



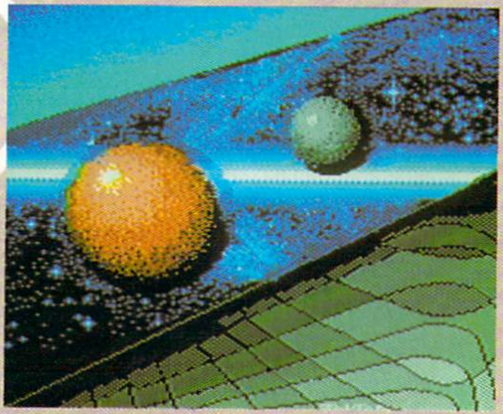
L'oiseau
by Alain Ducharme, Hull, Quebec
Paint Magic



Pyramids
by Leo Loebs,
Coeur d'Alene, ID
Cyber Video

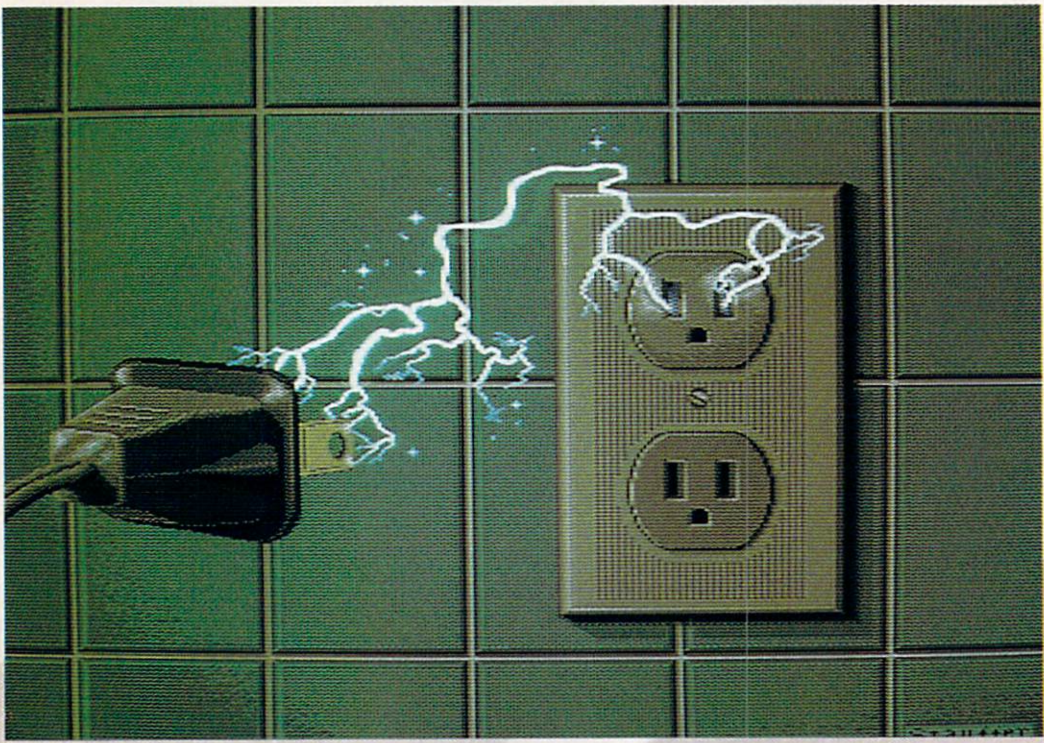


Cruisin'
by Dave Hartman, St. Ann, MO
Advanced Art Studio



Place in Space
by Jokton Strealy,
Los Angeles, CA
Koala Painter

AMIGA GRAPHICS CONTEST



Over 150 entries were received in our first annual Amiga Graphics Contest. Winners were selected for originality, creativity and best use of the Amiga's unique graphic features.

Grand Award: $500

sparks
by DeWayne Stauffer, Pocatello, ID
DeluxePaint II

RUNNERS UP

$100 each



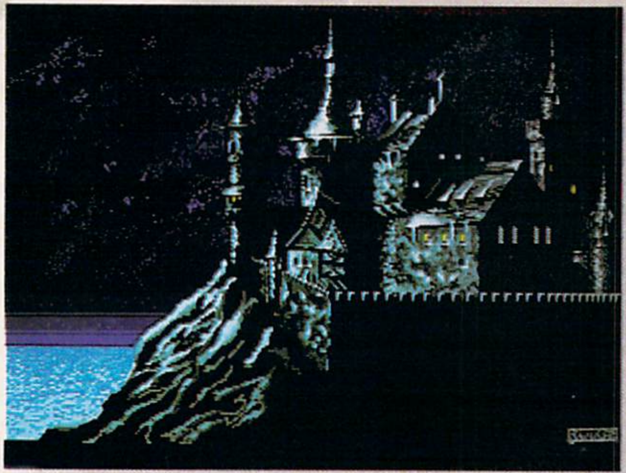
Slow Dream
by Lori K. Bradley,
Atlanta, GA
Digi-View, Digi-Paint



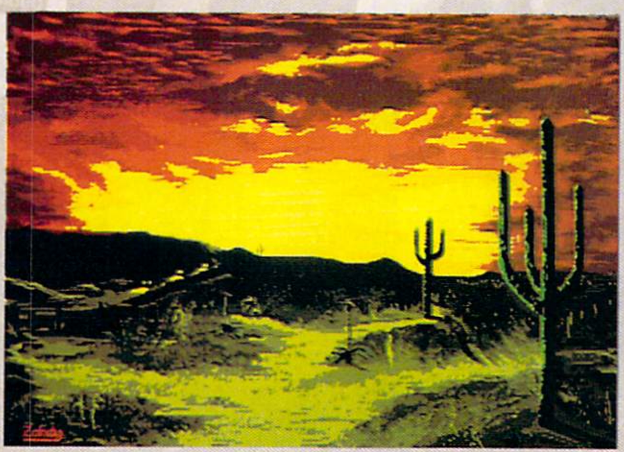
Cardinal
by Anne Cole, Albuquerque, NM
DeluxePaint II



Night Wanderer
by Jason Sweeney, La Palma, CA
DeluxePaint II

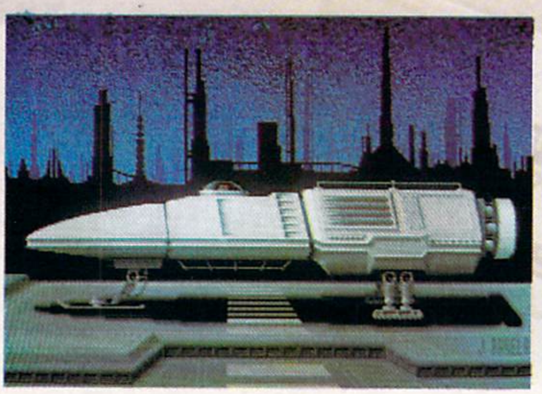


Midnight
by Bob Swiger, New Castle, DE
DeluxePaint



Arizona Sunset
by Dr. Adel Zohdy, Lakewood, CO
DeluxePaint II

HONORABLE MENTION



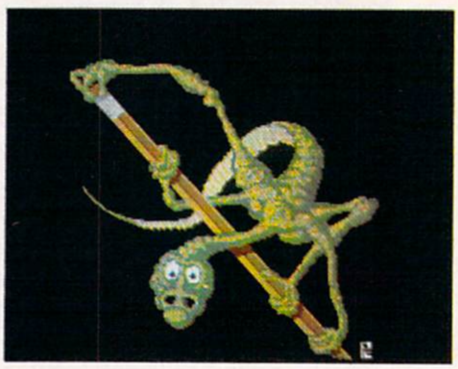
Yet Another Spaceship
by John D. Barela, Pomona, CA
DeluxePaint II



Garden Visitor
by Bonnie Bisbee,
Mariposa, CA
DeluxePaint



Fawn
by Roberta Beach, Winnipeg, Manitoba
DeluxePaint II



Creature
by Pete J. Caravas, Jr., Portsmouth, VA
DeluxePaint II



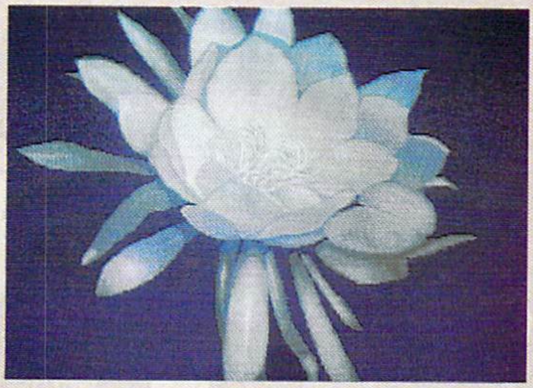
Portrait of Lisa
by Jacquelyn J. Dinora,
Lanham/Seabrook, MD
DeluxePaint II



Breakfast With Eyes
by David Foss, S. Barrington, IL
Digi-View, Digi-Paint, DeluxePaint II



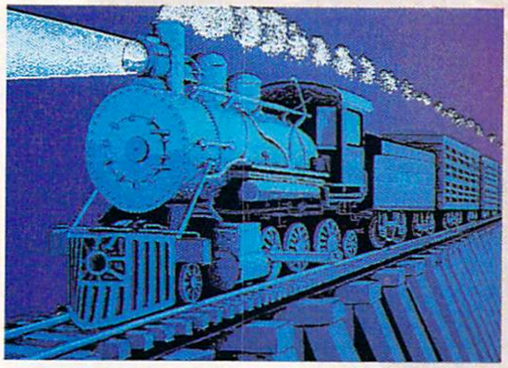
Something to See
by Félix Rodríguez Larreta,
Buenos Aires, Argentina
DeluxePaint II



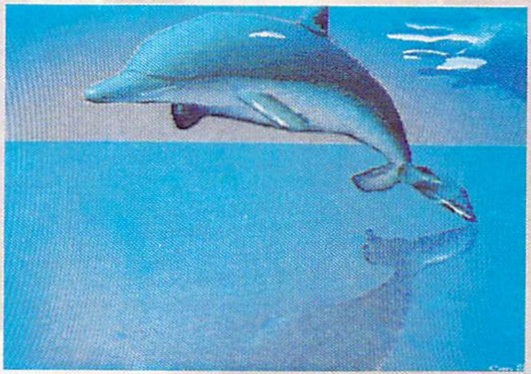
Cereus
by Roy E. Holes,
Blue Jay, CA
DeluxePaint II



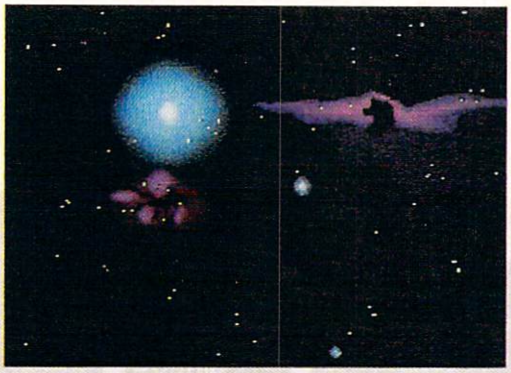
Keyboard
by Robert Laughton, Merced, CA
DeluxePaint II



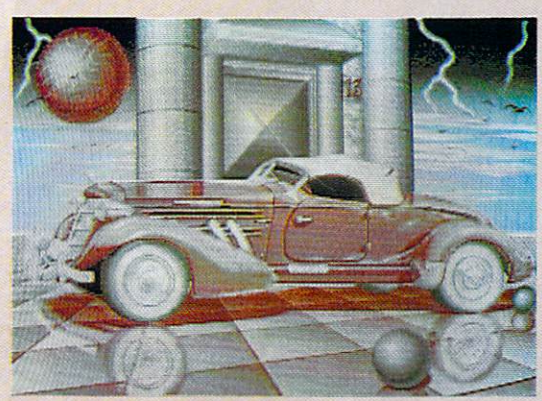
Night Train
by Jim Scharmen, Traverse City, MI
DeluxePaint II



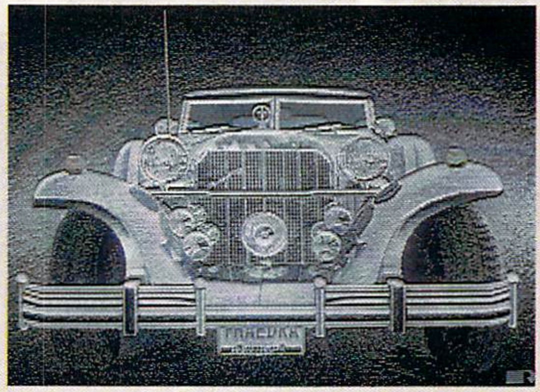
Dolphin Sunset
by Christopher G. Marsh,
Los Angeles, CA
Sculpt 3-D, Digi-Paint



Horse Head
by Gary D. Moseley,
Abilene, TX
Digi-Paint



Dream Number 13
by Orlando Petermann,
Muri, Switzerland
DeluxePaint II

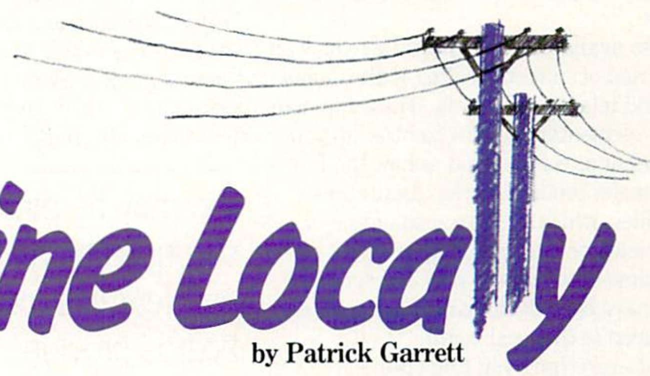


ExCar
by Douglas L. Rollison,
Indianapolis, IN
Aegis Images



TONY CROCETTO

What's Online Locally



Using a modem doesn't necessarily mean high monthly bills. More and more people are turning to their local computer bulletin board systems to enjoy the world of telecomputing.

by Patrick Garrett

How many times have you wanted to enter the world of telecommunications, only to be turned off at the last minute by the high cost of online time on national information services? Or perhaps you live outside of the local calling area of a Tymnet or Telenet node (a local number used to access national information services) and you would have to add long distance phone charges to the cost of any online time. Not an inexpensive proposition.

You can still explore telecommunications and enjoy online time without using a national information service or running up an outrageous phone bill. You can take advantage of the telecomputing opportunities in your hometown; chances are wherever you live you are just a phone call away from a local BBS. You may be pleasantly surprised by all the services and features local bulletin boards provide at very little or no cost to you.

Some of the services offered by hometown BBSs mirror those provided by the national networks. Services may include special interest groups (SIGs), program and text files for you to download, electronic mail, online games and even online music and graphics. We'll examine these offerings more closely in a moment. First let me give you some ideas on how to locate a BBS in your area.

Finding a Local BBS

If you don't know the phone number of a local BBS, there are several ways to find out if any are in your area. The first and easiest way is to pick up the phone and call your local computer stores. That's what I did after being transferred to a new city. These quick phone calls netted me two local BBS numbers. If there is a local user's group in your area, check with them. If there is a BBS in the area, someone in the user's group will know about it, or maybe the user's group itself runs a BBS for its members.

I found another local BBS number by looking in the yellow pages under computers (not BBSs). Many computer stores run a BBS after store hours. These are generally full of advertisements for the computer store, but many also provide a host of other services. Once you find a BBS to call, it will probably have a file posted on it called "Other BBS Numbers." This will list other bulletin board systems in your area. Now let's take a look at what your local bulletin board has to offer.

Electronic Mail

Just like the national services, local BBSs offer you the ability to send mail to other users. This mail takes the form of an electronic message. The message can be typed in from the keyboard while online or composed offline with your word processor and uploaded to the BBS with your terminal program. If the message is sent to just one user privately, then it can be seen only by the person to whom it is addressed. Or you can address a public message to a single user (which can be read by anyone who has access to that message base). You can also send a message addressed to "all" that can be read by all the users on that message base. Electronic mail is fast. It usually will be waiting for the user as soon as you log off, and it will be shown to that user the next time he logs on to the bulletin board.

Special Interest Groups

Just like the large pay services, local BBSs offer special interest groups. These SIGs are message bases dedicated to the discussion of a particular subject. For instance one of the local BBSs in my hometown, the ACCESS TBBS, has provided SIGs for all major brands of computers, plus a SIG for the discussion of astronomy and one set aside for local sysops' and sigops' use. (By the way, "sysop" is short for "system operator," and "sigop" is short for "special interest group operator.") If you have a problem with your computer or you need an answer to a question, the SIG dedicated to your particular machine can usually give you an answer.

These SIGs can provide hours of endless reading, usually free of charge. However, the sysop of this BBS charges a two-dollar registration fee when you request an account. In return for your two dollars you receive by mail an information packet which details the inner workings of the BBS and includes a help file that is worth much more than two dollars the first time you need assistance online.

Download Libraries

Many bulletin boards also have a library of programs and text files available for you to download. These download libraries are provided to you free of charge. The programs found here are public domain and range in quality from junk to jewels. Some of these are written by local users, and some are shareware programs that are available on national services and have been uploaded to the BBS by local users.

Some sysops may require you to share (upload) something before you can download, and some may enforce an upload to download ratio. A ratio of one to five blocks seems to be common in my area. In other words if you upload 100 blocks you can download 500 blocks.

One thing that impressed me was the amount of software available online. There are literally thousands of public domain programs in existence, many of which will be available to you. Also available are text files. ACCESS BBS has a

complete online magazine available to its users.

Also available are technical writings on a myriad of subjects dealing with computers and related equipment. These files can be as elementary as how to hook up your printer or as complicated as how the Punter transfer protocol works. Again these text files, which you can read online or download for later reading, are most often the same found on the national services that have been downloaded by a user and uploaded to the local board.

Not everything you find online is related to computers. Some even have short stories, written by other users for you to enjoy. If you are looking for an outlet for your own writing, you'll find an audience here.

Online Games

A very popular feature of information services is online games. Local BBSs also offer games for you to play online. Role-playing games in which the user assumes the role of a fictitious character are very popular. Games are usually conducted in message bases set aside for this purpose. Other online games on local BBSs in my area include trivia games, guess the word/phrase-type games, tic-tac-toe and Battleship-style games. The games offered are determined by the sysop and differ from board to board. Online games can provide you with many hours of enjoyment or many hours of frustration depending upon your gaming skills.

Music and Graphics

One attribute unique to the pay services has been their use of slick graphics. Colorful graphic menus add a professional look that sets them apart from local BBSs. This is rapidly changing. Now quality col-

> You may be pleasantly surprised by all the services and features local bulletin boards provide.

or graphic BBSs for the Commodore 64 and 128 are fast becoming commonplace. These local BBSs use full-color menus and have graphics that rival (and in some cases surpass) those on pay services. Some BBSs will even allow you to view popular demo programs and listen to the music while you are online. I know of no pay services that allow this.

Network Mail

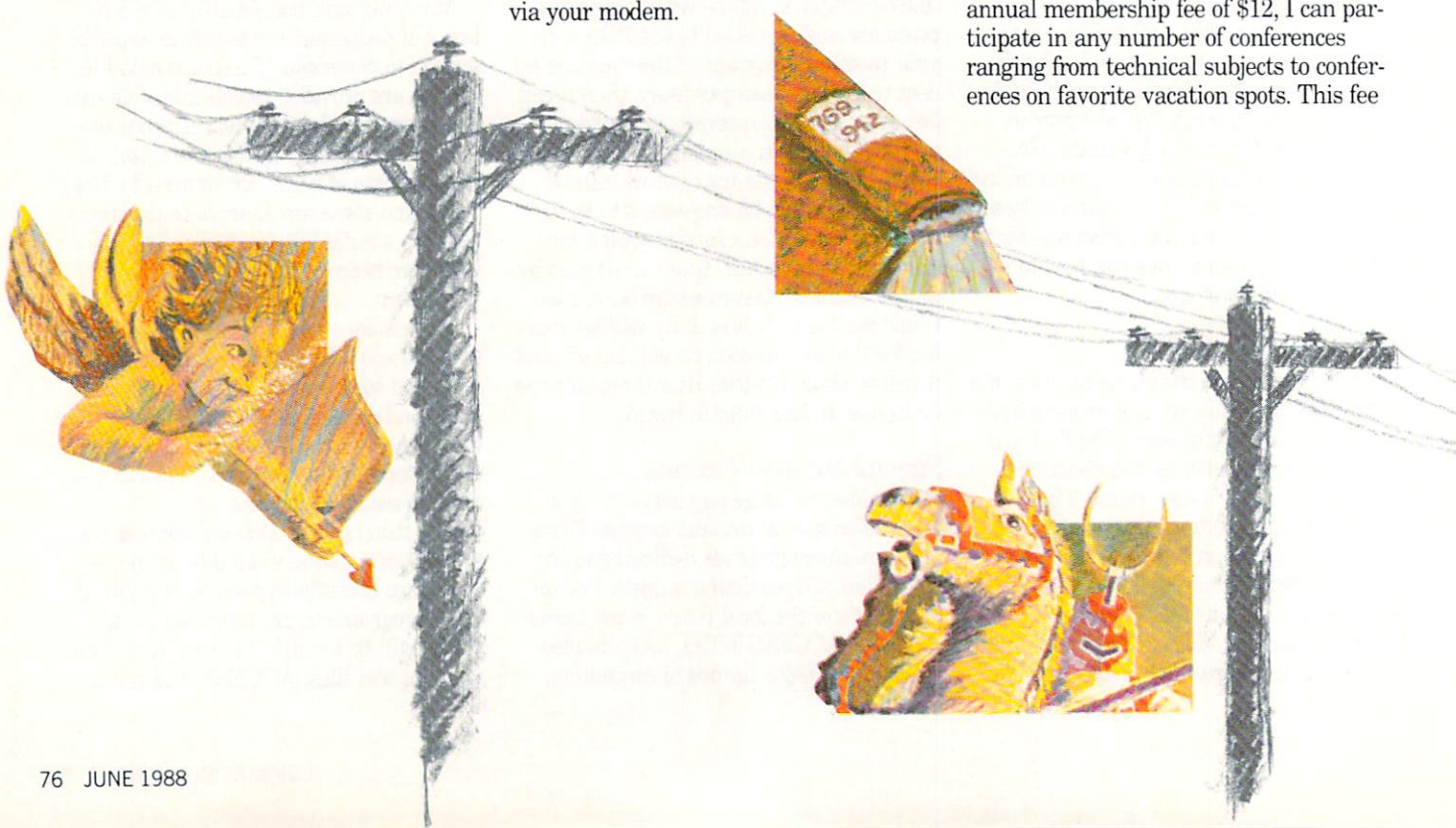
Another feature of pay information services that I enjoy is the ability to talk to people across the country. Doing this helps me stay informed by giving me a cross section of opinions, in addition to those of the people close to me. Now even this aspect of telecomputing is available to the local user in the form of networking. Many BBSs are now linked together by phone. You can converse with other users across the country, even around the world via your modem.

Each network differs in its operation, and most involve a small charge to send your message, usually based on a per message basis. On one local BBS I can send unlimited messages locally free of charge. I can post messages to BBSs on my network within my home state of North Carolina for about 22 cents a message. Outside my state the messages range in price from 22 cents to around three dollars. The three dollar charge is for a message to Melbourne, Australia. My wife and keeper of the checkbook was elated to find out I didn't know anyone in Melbourne.

Most of the local networks do their work during the early hours of the morning. After you log on and post a message, the BBS waits until a preset time of low usage to process outgoing mail. The one BBS in my area that provides network mail closes down to users shortly after midnight and begins processing mail. All the mail is packed up and sent to another BBS that serves as a hub for the network in North Carolina. From there the mail is sent to its destination. It will be waiting for the recipient the next time he logs on to his local board.

Conferencing

Another service provided by local BBSs is online conferencing. Conferencing is nothing more than SIGs with users spread out across the country. This conferencing usually costs less for the sysop to provide than net mail, so this is usually a less expensive way to use your modem. For an annual membership fee of $12, I can participate in any number of conferences ranging from technical subjects to conferences on favorite vacation spots. This fee



allows me to read and post messages that will be read by other conference users wherever they may be. Conferencing can provide a wealth of information at a minimal cost.

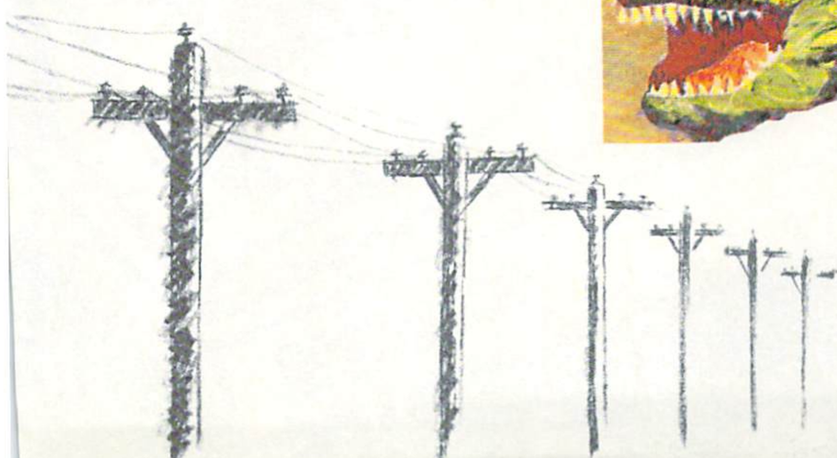
Getting Online

Now that you have seen what valuable services local BBSs have to offer, let's take a look at how to actually get online. After you find a BBS to call, you need only four items to go online: a computer, a modem, a terminal program and a phone line. These four keys will unlock the exciting world of telecommunications. The type of computer you use for telecommunications is not important thanks to a standard language computers use to communicate with each other called ASCII (American Standard Code for Information Interchange). Commodore computers have a slightly different version called PETASCII. This different version allows full use of the machine's special color and graphic characters. Most terminal programs have an option to translate their versions into standard ASCII as well. So virtually any type of computer can be used for telecomputing purposes.

The Modem

One item you'll need to begin telecomputing is the modem. The modem is a device that converts the digital electrical impulses your computer uses into an analog signal that can be translated over the phone line. This conversion is called "modulation." The modem also converts the analog signals it receives from the modem it is connected to into digital impulses your computer can understand. This is called "demodulation." From the terms "MODulate" and "DEModulate" the modem gets its name.





The speed at which the modem operates is called its baud rate. It is measured by the number of bits of data the modem can transfer per second. The most common baud rates in use today are 300 and 1200 baud, although modems using 2400 baud are fast replacing the slower modems. Generally speaking, a modem's price is proportional to its baud rate. There are 300 baud modems on the market now that sell for around $30. Modems with 1200 baud rate operate four times faster and cost from $90–140, while 2400 baud modems, twice as fast as 1200 baud modems, sell for around $200.

> Not everything you find online is related to computers. Some even have short stories, written by other users for you to enjoy.

Which is best? It depends entirely upon what you want. Modems with 300 baud rate are fine for reading and posting messages. This is a comfortable speed to read the messages and is faster than most people can type. However, if you plan to do a lot of up/downloading then 1200 or 2400 baud may be best for you. I've found 1200 baud to be plenty fast for me.

Let me explain some other features you should look for when purchasing a modem. One feature your modem should have is auto-dialing. Auto-dialing is the ability to dial a phone number and make a connection if a computer answers. Auto-answering is another feature you may need. An auto-answer modem will answer the phone and send an answer tone if the phone rings while the modem is turned on. This feature can also be a hindrance as the modem will answer and send an answer tone to whomever is on the phone, whether it is another computer or a cousin calling long distance to tell you about Uncle Earl's operation. Fortunately, most of these modems also have a way to turn off the auto-answer feature, either by a switch on the modem or a command issued from your keyboard.



Something else to consider when shopping for a modem is whether the modem has some way to inform you of its activity. It should have some way to let you know when the modem is dialing, whether the phone on the other end is ringing or is busy, or if the modem is connecting or hanging up. These status indicators come in two forms. One is a row of tiny lights called LEDs to display the status of the modem. Certain LEDs are lit corresponding to the activity of the modem. LED status indicators have one disadvantage. You have to visually check the modem to see what it is doing.

The second and simpler method is via a built-in speaker. With this type of modem you can hear your modem dial, and you can hear it make a connection or encounter a busy signal. Most of these modems will automatically cut off the speaker when a connection is made. On most of these you can adjust the volume of the speaker and how long the speaker stays on, if at all. I prefer this type of modem, as it allows me to do other things while the modem redials a busy number. All I have to do is listen for a connection to be made.

The Software

The next, and probably most important item you'll need is a terminal program used to coordinate your computer with your modem, disk drive and printer. Your terminal program should be powerful yet easy to use. If you don't have a terminal program for your computer, check with your local user's group. Be sure you describe the equipment you'll be using, and don't be shy about letting them know you're new to telecomputing—ask them to recommend software that is easy to use.

Once you get online you'll probably find many different public domain terminal programs for your computer in the download libraries. Chances are one of these

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JIM LAMBRENOS

Power Printers

Probably no other peripheral puts more strain on your budget, is surrounded by more mystery or is more difficult to tame than your printer. We will discuss the various types, how they differ, which is best for what job and how much they cost. Then we'll offer some help on how to get your computer, software and printer to agree to work together—a goal which is often difficult to achieve.

by Gary V. Fields

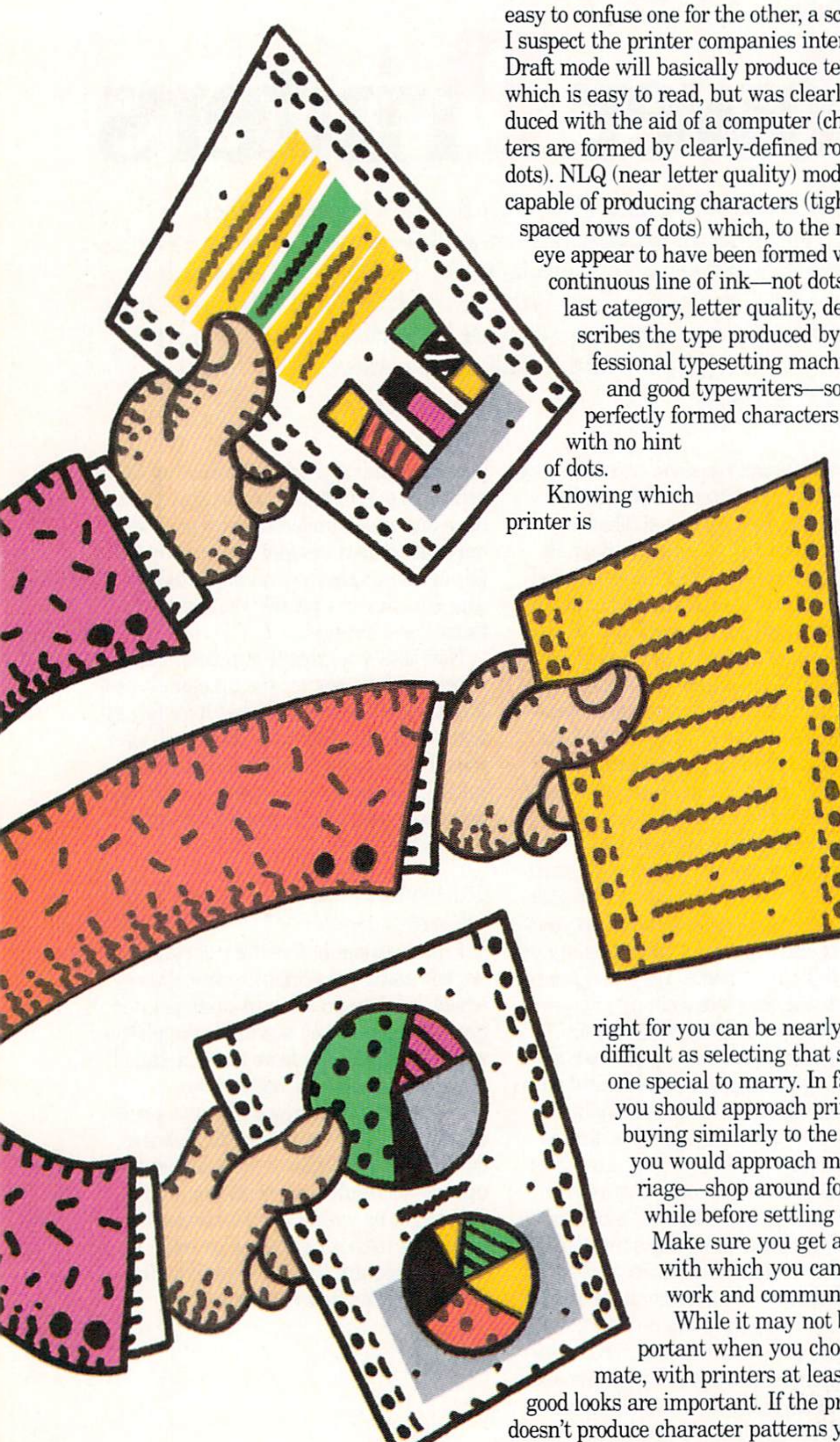
I distinctly recall someone once claiming that personal computers would totally eliminate our need for paper. That sage assured us that in the future (today) all information which needed to be recorded would be printed to disk instead of paper and all communications would be handled by phone via either voice- or modem-controlled data. Time has proven that prediction wrong. If anything, computers have increased our demand for printed words and graphics. Because computers and modern printers make it easier and faster to produce professional looking documents, we actually produce more.

This brings us to the subject of this article—printers. Probably no other peripheral you will own puts more strain on your budget, is surrounded by more mystery or is more difficult to tame. Yet it is a necessary part of a complete computer system. Word processors are wonderful for exchanging information if you can record those thoughts on paper to be shared with others. By the same token, the audience for computer-created graphics is limited unless the screen's image can be duplicated on paper. Every serious programmer quickly realizes how essential a printout is for debugging and editing a program. It is true that magnetic disks are perfect for storing information, and monitors are ideal for showing graphics and text, but until every person has access to compatible peripherals, the printed page remains the most affordable universal communication medium. To move words and graphics from your computer's memory to paper requires a printer. But having the printer is only half the battle, you must have one which understands those coded messages it receives and can quickly duplicate those messages on paper using tiny ink stains. A printer that does anything less is useless.

Now that we agree that printers are necessary, let's discuss the different types, how they differ, which is best for what job and how much they cost. Then we'll offer some help on how to get your computer, software and printer to agree to work together—a goal which is often difficult to achieve.

Different Printers/ Different Power

Printers come in five distinct categories: dot matrix, thermal transfer, daisy wheel, ink jet and laser. (A sixth printer type which we won't discuss is the plotter which uses pens to create finely-detailed drawings.) Each type has its own strengths and weaknesses. No two printers were created equal—speed, features, quality and cost differ greatly. Depending upon what results you need, you may be able to get by with a budget-basement priced dot matrix or thermal printer, or you may require the power and quality the new laser printers offer.



Printer modes are often described as draft, near letter quality, or letter quality. Two of the three labels are so similar it is easy to confuse one for the other, a scheme I suspect the printer companies intended. Draft mode will basically produce text which is easy to read, but was clearly produced with the aid of a computer (characters are formed by clearly-defined rows of dots). NLQ (near letter quality) mode is capable of producing characters (tightly spaced rows of dots) which, to the naked eye appear to have been formed with a continuous line of ink—not dots. The last category, letter quality, describes the type produced by professional typesetting machines and good typewriters—solid, perfectly formed characters with no hint of dots.

Knowing which printer is right for you can be nearly as difficult as selecting that someone special to marry. In fact, you should approach printer buying similarly to the way you would approach marriage—shop around for a while before settling down. Make sure you get a unit with which you can live, work and communicate.

While it may not be important when you choose a mate, with printers at least, good looks are important. If the printer doesn't produce character patterns you find pleasing to look at—don't "marry" that printer.

Dot Matrix Printers

Without doubt, the most popular printers on the market today are dot matrix. Their popularity is understandable—they are fast, flexible, affordable and hard working.

This category gets its name from the matrix of pins in the printing head which transfers ink from a ribbon to paper. Depending upon the printer, the row of pins in this matrix may be as loose as seven pins or as compact as 24. As the printer receives information from the computer, it causes these pins to protrude from the head and press the ribbon against the paper transferring ink just as a typewriter does. But best of all, the signals from the computer can push these inking pistons at speeds which allow the machine to type up to 250 characters per second.

Because the computer, not the design of the print head, determines which pins strike and which do not, matrix printers can handle graphics just as easily as text. This flexible head arrangement along with the printer's ability to advance the paper minute and exact distances make it possible to duplicate screen displays on paper.

Depending upon the pin count and the ability of the printer to overstrike images, the final printouts from a dot matrix printer can approach letter quality. The number of pins in the print head and the quality of the final document correspond directly. If you want both speed and quality, you should consider a dot matrix printer with as many pins as you can afford. Currently the maximum pin count is 24, and without the aid of a magnifying glass it is difficult to discern the results produced with these printers and those of the more expensive laser printers.

If you want both speed and quality, you should consider a dot matrix printer with as many pins as you can afford.

Dot matrix printers have two negative aspects: they are noisy (any time even a tiny pin strikes a platen as often and as fast as the ones in these printers do, it is going to produce some noise) and when shifted into near letter quality mode their speed is reduced by half. But on the positive side they are without argument the

most flexible and affordable of all printers. A good dot matrix printer should set you back no more than $500, and some good ones retail in the $200 range.

Thermal Printers

Thermal printers have an appeal which is hard to resist—they are affordable, flexible and quiet. The printer gets its name from the head used to print images—a heated surface. Using the same dot pattern as a matrix printer, the head of a thermal printer is heated, and when touched against heat sensitive paper, produces an image. Because there is no pounding of pins against a platen, the printer action is very quiet. These printers can't print as fast as matrix printers (averaging 100 characters per second), but because their dot image is smaller than a matrix, the images are produced in higher resolution.

These printers use thermal paper and require no ribbon to produce an image. When the printing head touches the paper, an image appears, but these dot patterns are never as dark as those created with ink. Worse yet, the printouts will fade in time and with exposure to sunlight.

Some thermal printers are capable of transfer process printing—they heat a waxed ribbon and transfer its dye to the paper. Because of this the printer can produce multi-colored images as well as black on white. Colored results can be spectacular, but are slow and comparatively expensive since they require both colored ribbons and multiple overstrikes. Along with the special ribbon, you'll also need paper which is perfectly smooth. Any texture in the surface of the paper will result in breaks in the colored images. Because of these added expenses (ribbons and special paper) a page produced in color will cost an average of 60-70 cents while the same page produced entirely in one color would cost only nine or ten cents. Transfer ribbons are not reusable, so after the ribbon has been used once it must be replaced.

When buying any peripheral, you need to consider the expense of its supplies in addition to the initial cost. Thermal printers, while reasonably priced, are probably the most expensive of all to maintain. They require special heat-sensitive (thermal) paper which is more expensive than regular paper (and can sometimes be difficult to locate). Using transfer ribbons makes your printing cost really jump.

When buying any peripheral, you need to consider the expense of its supplies in addition to the initial cost.

Prices for thermal printers range from under $100 to well over $1000.

Daisy Wheel Printers

Daisy wheel printers get their name from the shape of their printing wheel which resembles the head of a daisy. Imagine a metallic flower with printable characters pressed into the end of each petal. This printing wheel is positioned (sort of like the element in a Selectric typewriter) so it can rotate and a rubber hammer can press the letters on its tip against the inked ribbon and that against the paper. To understand a daisy wheel printer you simply have to imagine an electric typewriter hooked up to your computer.

The appeal of these printers is the excellent quality of the printed images they create. In a business office where correspondence is expected to be personalized, the ability of a daisy wheel printer to produce form letters which, to all appearances, look as if they were typed and printed individually is valuable. These printing wheels can be switched (even during a printing session) to change type faces, and making the wheel change is as simple as snapping one off and replacing it with the one you want.

A daisy wheel printer's strength—letter quality results—is also its weakness. Because it can only reproduce the characters supplied on the printing head, it can't produce expanded or compressed type nor can it handle graphic dumps. And because the head is constantly rotating, daisy wheels are slow, averaging around 40 characters per second. They are also very noisy—imagine a typewriter pounding away at top speed. Recognizing this, some manufacturers offer sound shields which minimize the noise problem. Unfortunately, these muffling devices are usually unsightly, cumbersome and expensive.

The price of a daisy wheel printer can vary from just a few hundred dollars to nearly $2000. I've found them great for producing professional correspondence, but they lack the flexibility to take advantage of the graphic capabilities of the 64, 128 or Amiga.

Ink Jet Printers

The one printer type most often overlooked is the ink jet printer. As hard as it may be to imagine, these printers produce images by squirting ink through tiny nozzles. Because these nozzles are so tiny, the dot (ink stain) produced with these printers is much smaller than those produced with a matrix printer. Ink jet printers are usually able to produce more professional-looking documents than either the dot matrix or thermal printers. Plus, if the printer has more than one nozzle, inks of different colors can be sprayed—so you can get quality images in full color. As you would expect, the price tag for producing both quality and color is stiff. But if you shop around, there are some bargains out there. (I've seen advertisements for a Canon color jet printer for under $400.)

Now you are probably asking, "If that is true, why aren't we all using ink jet printers?" There are two reasons: mess and speed.

The early ink jet printers earned a reputation for being less than neat to work around. If you've ever walked away from a printer ribbon installation battle with soiled fingers, imagine the stains you can get after a mishap using cartridges of liquid ink. The new generation of ink printers has effectively cleaned up their ink storage problems, so using an ink jet printer no longer means you'll be known as "old blue thumb."

Maintenance, however, can still be a headache. Because the opening in the nozzle is so tiny (0.065mm), paper dust or dried ink can clog it, rendering the printer useless until it is purged. The manufacturers have devised workable schemes to clear the head and drain the ink back into the cartridge before it can dry in the newer models.

With the mess and maintenance problems solved, only the lack of speed keeps these printers from becoming the darling of the computer industry. The least expensive ink jet printers crawl along as slowly

Continued on page 116

by Mark Jordan

Two-Potato

Explore the Commodore 128 in its powerful native mode. Some of the articles in this column may be technical, some not so technical—but we guarantee that they will spark your creativity.



ART BAXTER

Have you ever wished you could come up with some good ideas for something or the other but you just couldn't? Maybe you're in school and would like to do a computer-related project. Maybe you want to come up with something special for the users' group. I'm often asked where I come up with my ideas for a program/article every month. My answer to that question is this article. It is my hope that this brief autobiography will be helpful to you in generating (and keeping) ideas for yourself.

To begin with, you will note there is a program included with my answer: it's a game called "Two-Potato." Not only is it a fun game to play, but this program, more than most I've written, will demonstrate how an author gets his ideas when no ideas seem to come. The explanation on how to play Two-Potato is in the sidebar accompanying this article.

The first way to get ideas (my favorite) is just to have them pop in my head. In Greek mythology Athena was born by simply jumping from Zeus' head, fully clothed and ready for battle. I love ideas that spring from my head like that, but unfortunately, they are undependable. They come when they feel like it. This clearly won't do when you're required to have at least one good one per month.

(Besides, according to the myth, Zeus had been having one wicked headache and had asked Hephaestus to split open his head with an axe . . . which he did. That's when Athena made her grand entrance. Which just goes to show that even this method has its drawbacks.)

Shucks. You were hoping it was going to be easy. Despair not: method number two —described in the old adage, "Necessity is the mother of invention"—isn't too hard. Many good ideas come to me when I have a problem or a need. When the 128 first came out I wanted an 80-column word processor badly but none were available. So I wrote one ("ArcheType," May/June 1986). At other times I'll be working on a project when I realize I really need another program to do something else. A lot of programming utilities are born this way. In these cases the idea is a part of the process of doing something else.

A third way I come up with ideas is by copying somebody else's ideas. Nothing hard about that. But isn't that cheating? Nah. "There is nothing new under the sun," said King Solomon. But there are new ways to do old things.

Often I'll see something I like and think I can do it better. I wrote a program for *Commodore Magazine* several years ago called "Punch" (February 1986). It was a spin-off on the *Pong* motif. Even when I wrote it in 1985, *Pong* was already long dead. But I thought I could write a good magazine game similar to it that would spice up the action, add some humor, and improve the game play. Instead of ping-pong paddles I used boxing gloves. Instead of just deflecting the ball back you could also punch it back (hence the name). To add humor I placed a face above each pair of gloves, one looking like a thug, the other just the opposite—a nerd. New twists on an existing idea.

Sometimes it seems an idea still won't come—no Athena, no necessity, no nothing. At times like this a certain stereotype comes to mind: you see an author pacing the floor, thinking, pacing, trying and prying to come up with an idea but to no avail. He stomps around, gets mad at his wife, is impossible to live with. Finally, he decides to forget it, this time the well truly has gone dry. He goes on a walk with his wife (an apology, of sorts) and talks about anything but his troubles. For a moment he forgets them. Then, out of the clear blue, ZAP! The solution hits him like a 2x4. "Eureka!" he shouts. A program/article is born.

That's the stereotype . . . and it really does happen. Several of my best programs have come to me after I had given up completely. This is the old "stop the left brain and give the right some time to work" theory. I am a believer in it. Sometimes the best way to fertilize the idea portion of your brain is to simply take a break.

But that's not the only way to prime a bone-dry idea pump. One of my most productive ways of getting good ideas when the muses aren't musing is one that may be peculiar to me but I don't think so: I sprite-doodle. With the 128 this is really convenient. I turn my computer on, type SPRDEF, and off I go. Maybe it's a face I'm after. Maybe a logo. One article I

wrote for this magazine ("Mobsters," January 1987) started out as I was sprite-doodling some alphabetic characters. I got in a whimsical mood and started giving my letters eyes and noses and mouths. Pretty soon I had an entire alphabet of friendly characters . . . and an article.

Another time one of my sprite faces inspired a game ("Jungle-Heat," October 1985). I'm sure many artists in other areas of endeavor—painting, photography, pottery—have come up with some of their creations just by sitting at the potter's wheel and giving it a kick.

Finally, I have one more technique for conceiving ideas, and it's how I came up with Two-Potato. I call it "Get 'em while they're hot." This method is dependent on all the above mentioned. Here's how it works:

While developing an idea for an article I almost always get several more ideas; sometimes a dozen or more good idea-seeds show up. In the past, when I wasn't required to come up with an idea a month, I mulled over them for a couple moments then set them on my brain's back burner and continued work on the task at hand. My brain being what it is, does not place high memory priority on back-burnered items. It seems to treat them with disdain, particularly when I'm trying to retrieve the ideas I thought I had stored away. I just can't remember them.

Today I no longer trust my memory—I write them down. I keep a notebook of ideas. Two weeks ago I racked my brain for this month's program. I had several ideas but as I developed each, none seemed to click. So I got out my notebook. I read the ideas. Only one of them raised my pulse even a blip. My notation read: "Do a game similar to *Q-Bert*, but have letters on the pyramid that the player(s) must get in order to spell out words." As you can see, this idea was a copycat idea originally but with a twist.

That's all I had to go on but it sounded like fun. Two-Potato was born.

Now please let me be honest: there is more to creating programs than just inspiration. You know the percentages: 3% inspiration, 97% perspiration. It's true. But I think the 3% comes at the beginning of the process. You could never put up with the 97% part if it weren't for that spark. ■

How to Play Two-Potato

As mentioned in the article, Two-Potato is a bit of a spin-off on *Q-Bert*. The only real similarity though is the screen's appearance (a pyramid of diamond-shapes) and the players' movements (you jump from diamond to diamond). The differences are great.

Two-Potato is a two-player game. The sprites the players control look, in a way, like potatoes. (Now you know where the name comes from.) The goal of the game is to spell out a word before your opponent does by jumping to the diamond with the letter you need and firing. The word you must spell is up at the top of your side of the screen. What is your side? It's the side you start out on. The player who uses his joystick in port 2 plays with a white potato on the left side of the pyramid. Port 1 player controls a brown spud on the right.

The game starts when the words each player must spell appear at the top of the screen (each player has a different word). Get busy and hop up to the first letter you need. When you get there, fire. The letter will show up underneath your word. Also, when you fire the diamond will change colors. Why so? To make it more difficult for your opponent; he will not be able to use that letter until it changes back to the original color (blue). That takes about five seconds.

You will then proceed to the next letter you need and fire away.

There are some pitfalls. As mentioned, if your opponent has fired recently on the letter-diamond you want, you'll just have to wait around until it changes back. But be careful—if you wait without moving your man too long, he'll be transported back to where he started, the bottom of the pyramid. So keep your tater moving.

But don't move too quickly. If you aren't careful you may jump off the edge. That wastes lots of time. Or you may inadvertently jump on the same spot as your opponent. Back to square (or diamond) one you'll go. And don't get trigger-happy. If you accidently press the fire button on a diamond that contains the wrong letter, you'll lose all the letters you've acquired. The first player to spell ten words wins the game.

Play it once and you'll get the drift.

You can modify the program in two ways. One, you can change the word list found in the data statements in lines 880 and 885. The words don't have to be five characters in length but they should all be the same length. If you want to add more words (as it stands now there are 50) you'll need to change the FOR/NEXT loop in line 30 (it's presently set to read 50 items—0 to 49). And two, you may wish to speed up or slow down the length of time a diamond stays colored. Change the WA=200 in lines 150 and 475 to any number between 10 and 255 (the lower the faster).

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30008, Shreveport, LA 71130-0007, 1-800-831-2694.

Two-Potato

```
10 DIM W$(50),SS(8,8)'BORA
15 FOR T=0 TO 178:READ A$
   :POKE 2816+T,DEC(A$):NEXT'IUWL
20 FOR T=0 TO 71:READ A$
   :POKE 3072+T,DEC(A$):NEXT'ITRG
25 FOR T=0 TO 127:READ A$
   :POKE 3584+T,DEC(A$):NEXT'IUTM
30 FOR T=0 TO 49:READ W$(T):NEXT'FLAE
35 FOR T=1 TO 8:READ J(T,0),J(T,1),
   A(T,0),A(T,1),SV(T):NEXT'FNRP
40 SPRSAV 1,3:SPRSAV 2,4'CJGD
45 PRINT CHR$(142)CHR$(11)"[CLEAR]";
   'DKTJ
50 POKE 248,64:POKE 3071,2:COLOR 0,1
   :COLOR 4,1:COLOR 5,15'FBNK
55 L$="[RVS,SHFT POUND,CMDR *,DOWN,
   LEFT3,SHFT POUND,SPACE2,CMDR *,
   DOWN,LEFT4,RVOFF,CMDR *,RVS,SPACE2,
   RVOFF,SHFT POUND,DOWN,LEFT3,CMDR *,
   SHFT POUND]"'BCOV
60 XX=19:X=XX:Y=0:Z=1:A=65:C=1
   :MM=3328'HDYN
65 FOR T=1 TO 7'DDVJ
70 FOR I=1 TO Z'DDUF
75 CHAR,X,Y,L$'BHHK
80 IF X<>1 AND X<>37 THEN BEGIN'IGKL
85 CHAR,X+1,Y+1,CHR$(A),1
   :SS$(I,T)=CHR$(A)'GYTS
90 CC=55296+(X-1)+Y*40-1'GPVM
95 Q=INT(CC/256):Q2=CC-Q*256'GRTS
100 POKE MM+26+(C*2),Q2
   :POKE MM+27+(C*2),Q:C=C+1'KBNH
105 SS(T,I)=A-64'CKYD
110 A=A+1'CDPX
115 BEND'BBXC
120 X=X+6:NEXT'DEDY
125 Z=Z+1:Y=Y+3:XX=XX-3:X=XX'HRRL
```

```
130 NEXT:POKE 248,0'CGBA
135 SYS 3072'BEFE
140 FOR T=0 TO 26:POKE 3328+T,
    PEEK(3328+T)AND 15:NEXT'JVNJ
150 P1$="":P2$="":E=30:F=30
    :WA=200'FVOI
155 GOSUB 610:GOSUB 575:GOSUB 590'DLPI
165 DO'BAJG
170 IF S1=1 THEN BEGIN'EEYF
175 IF RSPPOS(1,1)<10 THEN GOSUB
    575'FLMM
180 GOTO 220'BDDE
185 BEND'BBXJ
190 J=JOY(1):IF J>0 THEN BEGIN'GIYJ
195 IF J>127 THEN BEGIN:GOSUB 340'FJIO
200 IF EX>0 THEN EX=0:EXIT'FHKB
205 BEND:GOTO 220'CFJD
210 BEND:GOSUB 485'CFBY
220 IF S2=2 THEN BEGIN'EEBB
225 IF RSPPOS(2,1)<10 THEN GOSUB
    590'FLKI
230 GOTO 270'BDIA
235 BEND'BBXF
240 H=JOY(2):IF H>0 THEN BEGIN'GIVF
245 IF H>127 THEN BEGIN:GOSUB 390'FJLK
250 IF EX>0 THEN EX=0:EXIT'FHKG
255 BEND:GOTO 270'CFOI
260 BEND:GOSUB 530'CFRE
270 E=E-1:IF E<1 THEN GOSUB 575
    :E=30'HNKK
275 F=F-1:IF F<1 THEN GOSUB 590
    :F=30'HNLP
280 LOOP'BAKE
290 IF WI>0 THEN BEGIN:A=88:CO=0'GMUM
295 CHAR,0,5,"[L. GREEN]PLAY AGAIN?"
    :CHAR,3,6,"Y/N"'CLPS
300 DO UNTIL A=39 OR A=25:SPRITE WI,CO
    :CO=(CO+1)AND 1:A=PEEK(212)'LEVL
305 FOR I=1 TO 30:NEXT'EFLF
310 LOOP'BAKX
315 IF A<>39 THEN SPRITE 1,0
    :SPRITE 2,0:P1=0:P2=0:WI=0
    :GOTO 45'KCVP
320 SYS DEC("E000")'CCCB
325 BEND'BBXF
330 GOTO 140'BDEB
340 IF VA=A AND VB=B THEN 380'FJUG
345 SYS 2842,0,0:RREG AC
    :IF AC THEN 380'ESRM
350 VA=A:VB=B'CHEF
355 P1$=P1$+SS$(A,B)'COLL
360 IF P1$<>LEFT$(W1$,LEN(P1$))THEN
    P1$=""'HRJL
365 CHAR,0,1,"[PURPLE,SPACE5,LEFT5]
    "+P1$'CICP
370 IF P1$=W1$THEN WA=10'EKXI
375 POKE MM+SS(B,A)-1,WA
    :IF WA=10 THEN 440'GVHR
380 RETURN'BAQF
390 IF VC=C AND VD=D THEN 430'FJYL
395 SYS 2842,0,2:RREG AC
    :IF AC THEN 430'ESPR
400 VC=C:VD=D'CHMB
405 P2$=P2$+SS$(C,D)'CORH
410 IF P2$<>LEFT$(W2$,LEN(P2$))THEN
    P2$=""'HRNH
415 CHAR,33,1,"[ORANGE,SPACE5,LEFT5]
    "+P2$'CJFL
420 IF P2$=W2$THEN WA=10'EKAE
425 POKE MM+SS(D,C)-1,WA
    :IF WA=10 THEN 455'GVRN
430 RETURN'BAQB
440 A=0:B=0:P1=P1+1:CHAR,0,3,"[PURPLE]
    WORDS WON"+STR$(P1)'HVKO
445 IF P1>9 THEN WI=1'EGGL
450 GOTO 465'BDOE
455 C=0:D=0:P2=P2+1:CHAR,27,3,"
    [ORANGE]WORDS WON"+STR$(P2)'HWWU
460 IF P2>9 THEN WI=2'EGII
465 EX=1:SOUND 1,15000,99,0,100,
    3000'CAPP
470 CHAR,0,1,"[SPACE5]"
    :CHAR,33,1,"[SPACE5]"'CMHK
475 WA=200:SLEEP 3:RETURN'DJAO
485 OA=A:OB=B:A=A+A(J,0)
    :B=B+A(J,1)'GADU
490 POKE MM+SS(B,A)-1,120'DOCM
495 IF B<>OB THEN E=30'FGTQ
500 SPRSAV SV(J),1'BIFB
505 MOVSPR 1,+(J(J,0)*24),+(J(J,
    1)*24)'FYQM
510 IF SS(B,A)=0 THEN S1=1
    :MOVSPR 1,180#2:SOUND 1,15000,200,
    1,1000,50:RETURN'HSNN
515 SYS 2973:RREG AC:IF AC THEN
    575'EOAK
520 RETURN'BAQB
530 OC=C:OD=D:C=C+A(H,0)
    :D=D+A(H,1)'GAPL
535 POKE MM+SS(B,A)-1,120'DOCM
540 IF D<>OD THEN F=30'FGYH
545 SPRSAV SV(H),2'BIEK
550 MOVSPR 2,+(J(H,0)*24),+(J(H,
    1)*24)'FYNM
555 IF SS(D,C)=0 THEN S2=2
    :MOVSPR 2,180#2:SOUND 2,15000,200,
    1,1000,50:RETURN'HSVW
560 SYS 2973:RREG AC:IF AC THEN
    590'EOWK
565 RETURN'BAQK
575 SPRSAV 3,1:MOVSPR 1,0#0
    :MOVSPR 1,28,200:SPRITE 1,1,2
    :SOUND 1,0,0'FJWV
580 A=1:B=7:E=30:S1=0'ENNM
585 RETURN'BAQM
590 SPRSAV 4,2:MOVSPR 2,0#0
    :MOVSPR 2,316,200:SPRITE 2,1,10
    :SOUND 2,0,0'FLST
595 C=7:D=7:F=30:S2=0'ENAS
600 RETURN'BAQA
610 R=INT(RND(1)*50):RR=INT(RND(1)*50)
    'ISJK
615 W1$=W$(R):W2$=W$(RR)'CSHL
620 CHAR,0,0,W1$:CHAR,33,0,W2$'CSFH
625 RETURN'BAQH
635 DATA A2,04,A0,04,91,FA,88,D0'BXFN
640 DATA FB,48,18,A5,FA,69,28,85'BXLJ
645 DATA FA,90,02,E6,FB,68,CA,D0'BXNO
```

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SUPER CHIPS

These really SUPER chips not only correct the bugs but also enhance the Commodore Operating System that your computer came with. For programmers, the most requested BASIC editing aids, such as MERGE and SEARCH/REPLACE, are now available at power-up. They also allow you to **convert any screen display into a BASIC program, with a single command.** Imagine how easy it is to create menus or pictures for your programs. Simply renumber your newly created BASIC program, save to disk and then merge into your main program! **Alternately, you can save to disk or recall any screen display with a simple command.** Presto, instant notepad!

SUPER CHIPS are ROM chips and require installation inside your computer. NO Soldering is required! You simply pull the original chips and replace with these. Complete instructions included!

!SUPER CHIPS are completely compatible with ALL software and are available NOW!

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C128 version	- $45.00
C64 mode on C128	- $35.00
C128D version	- $45.00

Please specify when ordering.

THE DRIVE BOX

This great little box is an absolute must for C128D or 1541 owners. It allows you to change your drive's device number with a flip of a switch. Even 1571 owners will appreciate its easy access! **The DRIVE BOX has another switch for writing to the UN-NOTCHED, FLIP SIDE OF A 1541 DISK.** Instead of fooling with a disk notcher, you simply flip the switch to write to the back side! Double your storage capacity instantly.

PLEASE NOTE: Installation requires a small amount of soldering.

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2 FOR 1 SERIAL BOX	- $29.00
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This is the most powerful two-dimensional CAD program available for your C128! As an object-based package (this is what the professionals use) your drawings are created and printed with the **greatest accuracy and detail possible.** This object-based design provides extreme flexibility and control over your drawings because each line, circle, text-string, etc. can be manipulated (rotated, enlarged, erased) as a separate entity. **With over 50 powerful commands,** you can translate, rotate and mirror objects. Stretch or shorten lines as needed. Easy create parallel lines. Draw or erase arcs, circles, ellipses and boxes at will. Insert library figures anywhere into drawings at any scale and angle. Scale text to any height and width. Work in either an absolute scale or feet/inches. Your drawing screen (a 16'' by 22'' page) includes **5 drawing layers** that can be selected/included/excluded/erased at will. HOME DESIGNER provides **accurate, lazer-quality output, at ANY scale, on your dot matrix printer or plotter.** Use a joystick or the 1351 mouse as input.

WHEN THE DETAILS ARE IMPORTANT! Still only $45.00

THE WRITE STUFF — WRITER & TALKER

This WORDPROCESSOR is by far one of the BEST that we have seen! Let's get right to the specs: 21 function calculator - line up numbers with the decimal tab; 60 customizable help screens - 86K of disk doc's; Double-column printing in one pass; Encyrpt/decrypt text; Sort up to ten columns (great for lists); Merge/Append text files; Link files; Word/paragraph counter; File translator for 15 other W/P's; Dvorak [- -] QWERTY toggle; True 80 column Hi-Res preview; Key-click for typewriter sound; Mail Merge; Automatic Case; On-line clock; 1764 RAM Expander support; MACRO TYPING cuts your typing time by over 25% and more!

The WRITE STUFF even comes in a TALKING version, which includes SAM, a program that produces speech from your computer's sound capabilities. This BB TALKER recites any portion of your text, can say each letter and command as it is typed, and translates to phonetic script for additional editing. **Great for the sight-impaired and the youngsters!!**

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128 Mode/Two-Potato

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```
650 DATA E9,60,8E,FE,0B,AD,10,D0'BXKK
655 DATA E0,02,D0,04,29,02,18,6A'BXTP
660 DATA 29,01,85,FB,BD,00,D0,85'BXML
665 DATA FC,A0,03,18,66,FB,66,FC'BXBQ
670 DATA 88,D0,F9,BD,01,D0,85,FD'BXHM
675 DATA A0,03,18,66,FD,88,D0,FA'BXJR
680 DATA A6,FD,A0,04,C6,FC,CA,CA'BXAN
685 DATA 88,D0,F9,A9,D8,85,FB,A9'BXBS
690 DATA 00,85,FA,E8,F0,0F,EA,18'BXXO
695 DATA A5,FA,69,28,85,FA,90,02'BXAT
700 DATA E6,FB,CA,D0,F2,18,A5,FA'BXSG
705 DATA 65,FC,85,FA,90,02,E6,FB'BXIL
710 DATA A0,02,B1,FA,29,0F,A0,06'BXJH
715 DATA AE,FE,0B,E0,02,D0,02,A0'BXMM
720 DATA 08,84,FC,C9,0E,F0,07,C5'BXOI
725 DATA FC,F0,03,A9,01,60,98,20'BXTN
730 DATA 00,0B,A9,00,60,AD,00,D0'BXIJ
735 DATA CD,02,D0,D0,0B,AD,01,D0'BXIO
740 DATA CD,03,D0,D0,03,A9,01,60'BXTK
745 DATA A9,00,60'BIBM
750 DATA 78,A9,3B,8D,14,03,A9,0C'BXTL
755 DATA 8D,15,03,58,60,A0,00,A2'BXTQ
760 DATA 1A,BD,00,0D,D0,06,CA,10'BXPM
765 DATA F8,4C,65,FA,DE,00,0D,D0'BXKR
770 DATA F5,86,FD,E8,8A,0A,AA,BD'BXCN
775 DATA 1A,0D,85,FA,BD,1B,0D,85'BXGS
780 DATA FB,A9,0E,20,00,0B,A6,FD'BXXO
785 DATA 4C,16,0C,CE,FF,0B,D0,CD'BXLT
790 DATA A9,02,8D,FF,0B,4C,65,FA'BXRP
800 DATA 00,39,00,00,FE,C0,00,FF'BXTH
805 DATA E0,03,F7,F0,07,DB,B0,07'BXVM
810 DATA BF,D8,0F,FF,F8,0F,FF,F8'BXLI
815 DATA 0F,FF,F8,1F,FF,F0,1F,FF'BXDN
820 DATA F0,1F,F9,30,1F,FF,F0,0F'BXQJ
825 DATA FF,F0,1F,E1,E0,33,FF,F0'BXFO
830 DATA 18,FF,98,0C,66,30,00,33'BXLK
835 DATA 00,00,66,00,00,F7,00,00'BXXO
840 DATA 00,9C,00,03,7F,00,07,FF'BXML
845 DATA 00,0F,EF,C0,0D,DB,E0,1B'BXIQ
850 DATA FD,E0,1F,FF,F0,1F,FF,F0'BXRM
855 DATA 1F,FF,F0,0F,FF,F8,0F,FF'BXCR
860 DATA F8,0C,9F,F8,0F,FF,F8,0F'BXEN
865 DATA FF,F0,07,87,F8,0F,FF,CC'BXXS
870 DATA 19,FF,18,0C,66,30,00,CC'BXLO
875 DATA 00,00,66,00,00,EF,00,00'BXMS
880 DATA GIRLS,CHAMP,UNDER,CRAZY,
    WITCH,CHECK,BLACK,YOUNG,DEATH,
    SHIRT,HEAVY,LAUGH,LOUSY,HOMER,
    QUIPS'BOVK
883 DATA FLOWN,STORM,HEFTY,WANTS,
    WINCE,STALE,EXIST,SUADE,MIXED,
    DUNCE'BJLF
885 DATA SLIMY,RAVIN,VINEY,AFTER,
    ABOVE,EARTH,OVENS,FILTH,GRASP,
    RIPEN,BALMY,SAXON,CINCH,QUOTE,
    WRITE'BOEP
887 DATA SWORD,TRACE,URBAN,RURAL,
    NEWSY,PORCH,EAVES,INPUT,BOARD,
    SHIFT'BJHJ
890 DATA 1,-1,0,-1,3, 1,-1,0,-1,3, 1,
    1,1,1,3, 1,1,1,1,3, -1,1,0,1,4,
    -1,1,0,1,4, -1,-1,-1,-1,4, -1,-1,
    -1,-1,4'BSAD
```

END

Amiga Software Reviews/Ports of Call

Continued from page 39

you view the map on the World Simulation Display, you will see small boxes containing numbers moving rapidly across the water. These represent storms of varying intensity. If you should happen to run into one, you will be asked whether you want to go around it (which delays the trip) or pass through. If you pass through, you may sustain damage points which cost money and take time to repair.

But wait, there's more! The sea is fraught with dangers. Pirates could confiscate your cargo! Rats on board could cause delays and subject you to fines! The Persian Gulf is a war zone! Don't forget the Suez Canal toll! Above all, watch out for those shoals, coral reefs and icebergs. If you encounter these perils, the screen is redrawn to display them with your ship on one side and the open sea on the other. You have to use the Navigation Control Panel to manually steer your way through. One more thing—on one of your trips you are more than likely to encounter a ship on a collision course with you. Use your radar screen to navigate to safety. You may also encounter a lost soul at sea—rescue him to increase your status points.

Once you have reached your destination, you must again decide whether to use the tugs. Docking manually is trickier than departing, as you must place your ship at a dead stop within a small rectangle with your bow pointing in the proper direction. Practice makes perfect, so they say. Once docked the Port Display appears, and your charter fee for the voyage is deposited in your bank account.

And so it goes. During the game your operating expenses and mortgage payments are deducted from your bank account. If you're lucky enough to accumulate money for a down payment on another ship, visit the broker. The price of the same ship varies from time to time and port to port. The ship you first purchased for five million dollars may later cost only three million. Unless you set a specific time limit, the game isn't over until it's over. You can almost continue playing indefinitely, hoping to increase your fortune or go bankrupt! Any time the World Simulation Display is on screen, you can save the game to reload later.

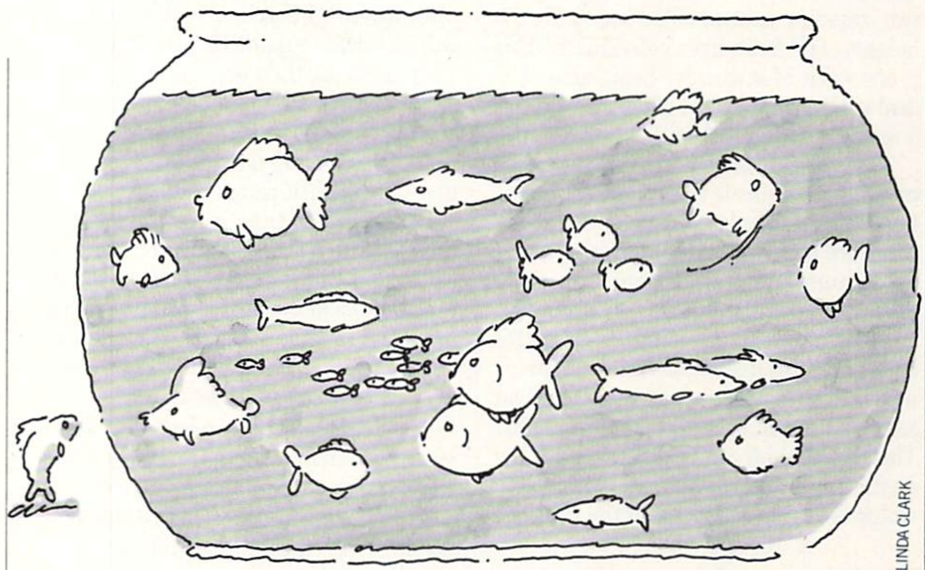
My only real criticism of the program is that the manual doesn't completely describe every option or explain certain important terminology. It also would have been nice if diagrams of the ports were included. Additionally, it is not easy to obtain all the information needed to determine whether a voyage will be profitable without "screen hopping" and performing mathematical calculations. Aegis could have made this easier. While there is an option to get a graphic screen dump to a printer, this feature isn't always operable, so you can't get printouts of any of the harbors.

Despite these minor drawbacks, I found *Ports of Call* to be a fascinating, engrossing simulation. The more ships you have, the faster things seem to move. The graphics are exceedingly crisp and colorful, the digitized sound is clear, and the animation is quite smooth and responsive to mouse control. Great effort has been taken to ensure the realism of the graphics—from the illustrations of the various ports and three-dimensional look of the World Simulation Display right down to the rivets and pegboard in the Port Display. *Ports of Call* shows off the capabilities of the Amiga and is a program that perhaps even the most die-hard arcade gamers might enjoy. I could probably go on forever *but*—here come those dreaded icebergs again.

by Ian Adam

Your Odds Are Good

for the Commodore 64 or 128



Statistics may seem like an esoteric topic, almost a foreign language, far beyond the realm of routine living. In fact, however, the science of statistics was developed to deal with real-life situations that we all encounter every day and can be a very straightforward and practical exercise. With its penchant for rapid manipulation of numbers, your computer is an ideal tool for dealing with statistical problems.

Admittedly, statistics can become a complex science when developed to its full potential, but this level of detail is not necessary when addressing common problems. This article will give you an introduction to this fascinating topic. In addition, the accompanying program can provide some basic analysis of any data set you enter.

Introduction

Have you ever asked a scientist a seemingly simple question only to get a complex mathematical answer? Ask, "Do fish swim?" and you're told "There's a better than 95% chance that those variables are correlated."

However, the statistical answer may be well-justified. The weather is a prime example: often, when the weatherman predicts a 50% chance of rain, it may seem that he's not really sure. But when a storm comes through and rains on you, leaving the next block high and dry, you may begin to see the rationale behind the prediction.

Statistics as Science

In reality, when you begin to study natural phenomena in all their minute detail, you soon find that things are rarely black and white. Changes are often tiny, subtle variations in measurements that are barely visible. The annual erosion in a river may be imperceptible, but over thousands of years the Grand Canyon is created. To study natural events properly, you need a great many observations, often spread widely over time or circumstances.

Science has responded to this problem by developing statistics. Using the proper techniques, complex masses of data can be tabulated and summarized in simple terms; variations can be examined to determine whether they represent true changes or just random error.

The first statistics were gathered more than 5000 years ago; they were used in census-taking, as well as (you guessed it) tax collecting. The modern era of this science began about 300 years ago with the application of mathematics to studies of gambling, comets and natural populations. Last year, in fact, marked the 200th anniversary of the introduction of the word "statistics" to English from the German language in 1787. The term finds its root in the Latin word *status*, meaning condition or state.

Much of the recent development in statistics has been through the field of biology. Feed two groups of rats different diets, and see which group gains the most weight, or is the most likely to get cancer. These results can be very hard to discern, when they are obscured by so many other factors such as the good or bad performance of individual animals and the random nature of cancer. Our modern society demands answers to such questions, however, and science has produced carefully controlled studies and comprehensive statistical models. These advances have also been helped by the availability of computing power that would have been unthinkable only a few years ago.

Standard Models

When you gather data on a subject, divide it into categories and plot it up as a bar chart, in effect you are creating a "picture" of the subject. This type of picture, or histogram, is one of the basic tools for analyzing results.

We've all heard of the bell-shaped curve, often referred to in such applications as "grading students on a bell curve." This shape is the most common one used in statistics, because it represents so many natural events so well. Whether you are plotting students' grades on a test, the height of trees in a forest or the weight of laboratory rats, the resulting graph usually takes on a bell shape. What this says is that the scores you looked at have an average and that most of the scores are fairly close to the average, but a few of them are much higher or lower than average.

Scientists have developed a standard model to represent the bell curve, called the Normal Distribution (also known as the Gaussian distribution, after one of its developers). The accompanying program allows you to graph a Normal curve, so that you can get a feel for this very typical pattern to see whether your data fits in.

The value of this kind of model is that you don't have to deal with all of the individual numbers all of the time. Once you have analyzed your data and fitted it into the model, you can then refer to the standard curve instead. Usually only two numbers, the average and the amount of scatter, are sufficient to describe the entire curve. The average is known as the mean, while scatter is measured with the standard deviation. When a scientist says that the height of the mature trees in a forest is a Normal Distribution with a mean of 125 feet and a standard deviation of 15 feet, another scientist knows exactly what

this means. It's a lot easier to quote those two statistics, instead of having to list the heights of all 3000 trees individually. This is one value of statistics—being able to deal with a complex set of data using only a manageable summary.

There is a second standard curve in the program, and this is the Poisson distribution. It is commonly used to represent the incidence of rare or random events, such as the number of traffic fatalities in a city in one week, or the number of customers entering a store in one minute. Unlike the bell curve, this distribution is not symmetrical, since values cannot be less than zero; as a result, it is skewed to the right. This distribution can be characterized by quoting only one variable, the mean, which determines the rest of the points.

The Program: Getting Started

The accompanying program will allow you to enter data that you have obtained from just about any source and analyze it to get its standard statistics. The results can be graphed on a couple of simple histograms and compared to the two standard models that I mentioned.

The program will work on the Commodore 64 or 128 in either 40- or 80-column mode. The program will automatically detect its host's mode and adjust accordingly. If you're using the 80-column screen on your 128, then the program will run in FAST mode.

Because of the ample memory available in either of these computers, very large data bases can be entered and processed. Line 500 defines a variable MP, the maximal number of points to be handled. MP is initially set at 500, enough to handle most situations you will encounter. If you need more, just set MP to a higher value before you start. With the 64 you can handle well over 600 data points, while the show-off 128 can analyze over 12,000 points before running out of memory. The time needed to analyze depends on the workload: a full house of 500 items can be analyzed and prepared for graphing in only about 30 seconds. If you have patiently entered 12,000 points, you've earned an eight-minute coffee break.

The easiest way to describe the program is to take you through it step-by-step. After typing it in and saving a copy, RUN the program. You will arrive at the main menu, which offers these choices:

1. **Load data from disk:** This will retrieve a database which you have previously saved to disk.

2. **Create new data file:** This is a good place to start. Press 2 and RETURN. You will be asked to name the data file (up to 12 characters), then begin entering data. Enter -1 to return to the menu.

3. **Save data to disk:** When you are carefully typing in data, it is a good idea to save it on disk periodically to protect your investment from rogue power failures. If a file by the same name already exists, you will be advised so that you can replace the old file or stop the SAVE operation and rename your file. File names automatically have .STA appended, to identify them as statistics files.

4. **Add to data:** This selection enables you to add more data to the end of a file that is already in computer memory.

5. **Edit current data:** Choose this selection to review the data and correct any errors. You will be asked to specify the data point to edit, and its current value will appear on the screen. Press RETURN to accept it as is, or type in the correction and press RETURN.

6. **Change the filename:** In case you need to rename the file in memory (see item 3 above).

7. **List data:** All data points in memory will be listed. You have the option of listing to screen or printer by entering "S" or "P" at the prompt. If you choose "S," the data will pause at each screen and wait for you to press RETURN.

8. **Analyze data:** The program will proceed to analyze the data for its key statistics, which will be printed (again, you choose screen or printer). It will also choose a series of classes and prepare the data for grouping.

9. **View Normal Distribution:** This selection will plot the standard Normal curve on the screen. After analyzing your data, you can come back to this choice to see how the results compare.

10. **View Poisson Distribution:** After making this selection, you must enter the mean value for the plot. A value of 4 gives a good illustration of the shape of the Poisson Distribution.

11. **End:** Look at lines 800 and 810: If you end the program accidentally, typing CONT (and RETURN) will make it restart, with your data still intact.

The Analysis

When you select data analysis from the menu, the program will present a number of key statistics, as follows:

- Name of data and number points.
- Data minimum, maximum and range: these provide overall information on the extent of the data.
- Mean: the average of all data values, typically the center of the bell curve.
- Variance and standard deviation: these measure the "scatter" of the data about the center. Standard deviation (square root of the variance) is the more useful, since it is measured in the same units as the data, and (in a sense) represents "average scatter." These calculations are on the assumption that the data is a sample, not a complete census.
- Coefficient of variation: this is deviation divided by sample mean, which can be interpreted here as the percentage of scatter.
- 2/3 interval: this range represents the center part of the bell curve and is defined as being within one standard deviation either side of the mean. With a Normal Distribution, typically 2/3 of the data points will be contained in this range.
- 95% interval: this range is two standard deviations each side of the mean; with a Normal Distribution, this range should contain 95% of the data points.

The latter two ranges help you determine whether your data fits the Normal curve, depending on whether approximately the right numbers of points are contained in the intervals. After viewing the statistics, you move to the analysis menu, with these choices:

1. **See statistics again:** This choice will reprint the major statistics, again to screen or printer as you choose.

2. **List data by class:** The program has chosen a series of classes, or categories, to sort the data into. This selection will list the classes, the number of data points in each and the accumulated data points again to screen or printer.

3. **Define classes manually:** The program decides automatically what classes to sort the data into, based on the range and number of data points. If you would prefer a different set of categories, you can specify these and the data will be resorted. You will select the number of classes, the start of the first class, and the width or increment of each class.

4. **Frequency histogram:** This bar chart shows the number of data points in each category, on a low-resolution graph. This is the "picture" of the data, to help you decide whether you are dealing with a bell-shaped curve, or something else.

5. Cumulative histogram: Also known as the "ogive," this chart shows the sum of all data points up to and including each class. It is useful for answering overall questions, such as "How many of the trees are over 150 feet high?" or "What grade do I need to be in the top 10% of the class?"

6. Return to the first menu: You can go back make changes to the data, view the

Please note that the program will frequently ask whether text output is to go to the screen or printer. If you find this annoying, note that simply pressing RETURN will echo your last response to that prompt, for as long as you continue to work with the same data file.

Applications

Statistical analysis has a surprising number of potential applications around the home. Say your car consistently gets around 25 miles to the gallon, then one tankful only gets 20 mpg. Is that a random variation, or is it time for a new car (or at least a tune-up)?

Similarly, important business decisions must be made every day, often based on incomplete information. Your factory produces 1000 widgets a day, with a standard deviation of 50. When trying out a new machine for one day, production is increased to 1200. Should you buy the machine, or did your staff just happen to have one good day?

The science of statistics may never enlighten us on such time-honored questions as "Is there a Santa Claus?" With this introduction, however, I hope that you have gained a measure of understanding of what this valuable science can contribute. ■

NOTE: *64 owners must disable the magazine entry program before entering line 600, or line 600 may be left out altogether.*

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30008, Shreveport, LA 71130-0007, 1-800-831-2694.

Stats

```
10 GOSUB 500'BDIX
100 PRINT"[CLEAR,YELLOW,DOWN]
    STATISTICAL ANALYZER[SPACE6]
    BY IAN ADAM[DOWN3]"'BAGG
110 PRINT" 1 LOAD DATA FROM DISK"'BAUC
120 PRINT" 2 CREATE NEW DATA
    FILE"'BAJD
130 PRINT" 3 SAVE DATA TO DISK"'BAUD
140 PRINT" 4 ADD TO DATA"'BAUC
150 PRINT" 5 EDIT CURRENT DATA"'BARF
160 PRINT" 6 CHANGE FILE NAME"'BASG
170 PRINT" 7 LIST DATA"'BARF
180 PRINT" 8 ANALYZE DATA"'BAGH
190 PRINT" 9 VIEW NORMAL
    DISTRIBUTION"'BANM
200 PRINT"10 VIEW POISSON
    DISTRIBUTION"'BAUE
210 PRINT" 0 END":PRINT'CBHY
230 IF NP THEN PRINT"DATA FUNCTION
    : "DF$:PRINT"POINTS:"NP'EIWJ
240 PRINT:PRINT"UP TO"MP"POINTS
    AVAILABLE":PRINT'DEMI
250 INPUT"[DOWN]SELECTION";A
    :PRINT'CDWF
260 IF A<3 AND NP THEN INPUT"LOSS OF
    DATA: OK";A$:IF A$<"Y" THEN
    100'INGO
400 ON A+1 GOSUB 800,1000,2000,1200,
    2500,3000,1700,4000,5000,8000,
    8000'DFIK
410 GOTO 100'BDAA
500 MP=500:DIM D(MP):REM MAX #
    POINTS'DWHG
510 DIM CM(40),CL(40),AC(40),PL(40)
    :POKE 53281,0'CKBI
520 DEF FN L(A)=10^INT(LOG(A)/LOG(10)
    -1)'JQLK
530 DEF FN R(X)=L*INT(X/L+.95)
    :REM ROUNDING'IVVM
535 REM USE LINES 540 TO 555 FOR 64
    (PLOT ROUTINE)'BJQQ
540 IF PEEK(48)>9 THEN CR=679
    :FOR I=CR TO 697:READ S:POKE I,S
    :NEXT:RETURN'MACQ
550 DATA 32,241,183,32,241,183,138,72,
    32,241'BKNL
555 DATA 183,138,168,104,170,24,76,
    240,255'BIKP
560 REM USE LINES 600 AND 610 FOR 128
    (PLOT ROUTINE)'BLVP
600 CR=65520:BANK 15:IF PEEK(215)
    THEN FAST:PRINT"[CLEAR,HOME2]
    "TAB(20)CHR$(27)"T"'JBEM
610 RETURN'BAQB
800 PRINT:PRINT"ENTER CONT TO
    RESUME"'CBDJ
810 END:RETURN'CBVE
1000 PRINT"LOAD DATA FROM DISK"'BALX
1010 CLR:GOSUB 500'CEWU
```

```
1020 D$=",S,R":GOSUB 1500,OPEN'DIOY
1030 IF A>19 THEN RUN'EDYY
1100 INPUT#1,NP'BEBU
1110 FOR I=1 TO NP'DENW
1120 INPUT#1,D(I)'BGPW
1130 NEXT:CLOSE 1'CCPX
1140 GOSUB 1600:GOTO 100'CIRA
1200 D$=",S,W":PRINT"SAVE DATA TO
     DISK"'CDTC
1210 IF NP=0 THEN INPUT"NO DATA
     : PRESS RETURN";A$:RETURN'FHKG
1220 PRINT"PRESS RETURN FOR NAME
     : "DF$'BDLE
1230 GOSUB 1500,OPEN'CFEA
1240 IF A>19 THEN RETURN'EDCC
1300 PRINT#1,NP'BEVW
1310 FOR I=1 TO NP'DENY
1320 PRINT#1,D(I)'BGKY
1330 NEXT:CLOSE 1'CCPA
1340 GOTO 1600'BEEB
1500 GOSUB 1700,NAME :REM OPEN
     FILE'CSND
1510 D$="0:"+DF$+D$'DHOC
1520 CLOSE 2:OPEN 2,8,15'CIKC
1530 OPEN 1,8,8,D$'BISD
1600 INPUT#2,A,B$:REM ERROR CHECK'CRBE
1610 IF A<20 THEN RETURN'EDWD
1620 PRINT"PROBLEM: "B$:CLOSE 1'CEYF
1630 IF A-63 THEN INPUT"PRESS RETURN";
     A$:RETURN'FHMK
1640 INPUT"REPLACE EXISTING FILE Y/N";
     A$'BDWK
1650 IF A$<"Y" THEN RETURN'ECYH
1660 PRINT#2,"S0:"+DF$:GOTO 1530'DKDJ
1700 INPUT"NAME OF FILE";DF$:PRINT
     :REM SET NAME'DNEI
1710 IF RIGHT$(DF$,4)<>".STA" THEN
     DF$=LEFT$(DF$,12)+".STA"'ISGM
1720 RETURN'BAQC
2000 PRINT"START NEW DATA FILE"'BALY
2010 CLR:GOSUB 500'CEWV
2020 GOSUB 1700,NAME'BJLX
2030 GOSUB 2500:GOTO 100'CIRY
2500 PRINT"ENTER NEW DATA POINTS"
     :PRINT'CBKG
2510 PRINT"NO NEGATIVE VALUES"
     :PRINT'CBXG
2520 FOR I=NP+1 TO MP:PRINT
     :PRINT"ENTER VALUE #"I'GJQK
2530 INPUT"DATA (-1 QUIT)";D(I)'BFUG
2540 IF D(I)<0 THEN RETURN'EFDG
2550 AN=0:NP=I:NEXT:RETURN'EJYI
3000 PRINT:PRINT"PRESS RETURN AT ANY
     PROMPT TO":REM EDIT'DGEG
3010 PRINT"KEEP THE SAME VALUE."
     :PRINT'CBEC
3020 P=0:INPUT"POINT # TO EDIT (0
     QUIT)";P'CFEF
3030 IF P<1 OR P>NP THEN RETURN'GFQD
3040 PRINT TAB(5)D(P)'CGBB
3050 INPUT"[UP]DATA";A:PRINT'CDGD
3060 IF D(P)-A THEN D(P)=A:AN=0'FOIH
3070 GOTO 3020'BECD
4000 I=1:P=21'CGCX
4010 INPUT"LIST DATA: SCREEN OR
     PRINTER S/P";P$'BDNG
4020 IF P$="P" THEN P=NP:OPEN 4,4
     :CMD 4'GLRE
4030 PRINT:PRINT"DATA POINTS FOR
     "DF$'CEAF
4100 PRINT"POINT[SPACE3]DATA"'BAPA
4110 FOR I=I TO I+P'EEVB
4120 IF I>NP THEN 4200'DHSC
4130 PRINT I SPC(6-LEN(STR$(I)))
     D(I)'FMAF
4140 NEXT'BAEB
4200 IF P$="P" THEN PRINT#4:CLOSE 4
     :RETURN'GGYD
4210 INPUT"PRESS RETURN";A$:PRINT'CESE
4220 IF I<NP THEN P=22:GOTO 4100'FLKF
4230 RETURN'BAQB
5000 IF NP<2 THEN INPUT"NEED MORE DATA
     : PRESS RETURN";A$:RETURN
     : ANALYSIS'FQGL
5010 INPUT"STATISTICS: SCREEN OR
     PRINTER S/P";P$'BDII
5020 IF P$="P" THEN OPEN 4,4
     :CMD 4'FHFD
5030 PRINT:PRINT"DATA ANALYSIS":PRINT
     :PRINT'EDMG
5040 PRINT"DATA FUNCTION
     :[SPACE4]"DF$'BDXG
5050 PRINT"NUMBER OF POINTS:"NP'BCAH
5060 IF AN THEN 5200:REM PREVIOUSLY
     ANALYZED'DACL
5100 MN=D(1):MX=0:T=0:S2=0'ERDE
5110 FOR I=1 TO NP'DENB
5120 T=T+D(I):S2=S2+D(I)*D(I)'FTIH
5130 IF D(I)<MN THEN MN=D(I)'EMLG
5140 IF D(I)>MX THEN MX=D(I)'EMEH
5150 NEXT'BAED
5160 M=T/NP:REM MEAN'DJKI
5170 S2=(S2-T*T/NP)/(NP-1)
     :REM VARIANCE'HYYP
5180 SD=SQR(S2):REM STD DEVIATION'DTWN
5200 PRINT"DATA MINIMUM
     :[SPACE4]"MN'BCEE
5210 PRINT"DATA MAXIMUM
     :[SPACE4]"MX'BCQF
5220 PRINT"RANGE:[SPACE11]"MX-MN'CETG
5230 PRINT"THE MEAN IS:[SPACE5]"M'BBRG
5240 PRINT"SAMPLE VARIANCE: "S2'BCCI
5250 PRINT"STD DEVIATION
     :[SPACE3]"SD'BCHJ
5260 PRINT"COEFF VARIATION
     : "INT(1000*SD/M)/10"%"'FLFP
5270 PRINT"2/3 INTERVAL
     :"M-SD"TO"M+SD'DGKN
5280 PRINT"95% INTERVAL
     :"M-2*SD"TO"M+2*SD'FIQQ
5290 IF P$="P" THEN PRINT#4
     :CLOSE 4'FFFM
5300 IF AN THEN 6000'CGJC
5310 IF US THEN 5420'CGOD
5400 NC=INT(SQR(3*NP+4))
     :IF NC>33 THEN NC=33
     : REM SET CLASSES'KFVP
5410 SP=(MX-MN)/(NC-1):L=FN L(SP)
     :CM(1)=FN R(MN-SP/2)'KJNR
5420 AN=1:GOSUB 6600'CIFG
6000 PRINT:PRINT:PRINT"1[SPACE2]
     SEE STATISTICS AGAIN"
     :REM ANALYSIS MENU'EPWK
6010 PRINT"2[SPACE2]LIST DATA BY
```

Continued on page 92

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	List $	Our $
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King of Chicago	$50	$34
Return to Atlantis	$50	$34
Roadwar 2000	$40	$28
Roadwar Europa	$45	$31
S.D.I.	$50	$34
Silent Service	$40	$28
Sinbad	$50	$34
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Pegasus	$30	$21
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Defender - Crown	$35	$24
Echelon	$45	$31
Full Count Bball	$40	$30
Gauntlet	$35	$24
Guderian	$30	$21
High Seas	$50	$34
Might & Magic	$40	$28
ML Baseball	$40	$28
ML Wrestling	$30	$21
NBA	$40	$28
Starfleet I	$40	$28
Stealth Mission	$50	$34
Up Periscope	$30	$21
Wizardry I	$40	$28
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Wrath - Denethenor	$20	$15

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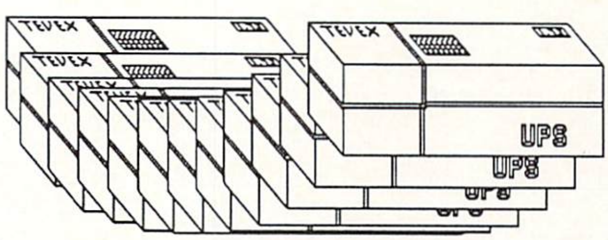
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Continued from page 90

```
      CLASS"'BAAE
6020 PRINT"3[SPACE2]DEFINE CLASSES
      MANUALLY"'BAAH
6030 PRINT"4[SPACE2]FREQUENCY
      HISTOGRAM"'BAJH
6040 PRINT"5[SPACE2]CUMULATIVE
      HISTOGRAM"'BANI
6050 PRINT"Ø[SPACE2]RETURN TO FIRST
      MENU"'BALJ
6060 PRINT:INPUT"YOUR CHOICE";A
      :PRINT'DECJ
6070 IF A<1 THEN RETURN'ECDH
6080 ON A GOTO 5000'CFGI
6090 ON A-1 GOSUB 9000,6500,7000,
      7500'DVEM
6100 GOTO 6000'BEDA
6500 US=1:REM MANUAL CLASSES'CRGJ
6510 PRINT"NUMBER OF CLASSES:"NC'BCGK
6520 PRINT"THE FIRST CLASS STARTS AT";
      CM(1)'BGHN
6530 PRINT"CLASS WIDTH:"SP'BCAK
6540 PRINT:INPUT"# CLASSES (MAX 33)";
      NC'CEVN
6550 IF NC<2 OR NC>33 THEN 6510'FLDN
6560 INPUT"NEW START";CM(1)'BGNN
6570 INPUT"NEW WIDTH";SP'BDTN
6580 IF SP<=Ø THEN 6570'EHJP
6600 L=FN L(SP):MC=CM(1)-SP:PRINT
      :PRINT"WORKING":REM CLASSES'HBYR
6610 FOR I=2 TO NC+1'EFOI
6620 CM(I)=FN R(MC+SP*I)'ENUL
6630 CL(I-1)=Ø'CHFJ
6640 NEXT'BAEI
6700 FOR I=1 TO NP:REM PUT DATA
      IN'EOWL
6710 C=(D(I)-MC)/SP:IF C>NC THEN
      C=NC'HSMP
6720 CL(C)=CL(C)+1:NEXT I'DNPL
6800 AC(1)=CL(1):REM ACCUMULATION'CXXN
6810 FOR I=2 TO NC'DEBJ
6820 AC(I)=AC(I-1)+CL(I)'DQGN
6830 NEXT:RETURN'CBXK
7000 MC=Ø:REM LARGEST CLASS'CQTE
7010 FOR I=1 TO NC'DEAC
7020 IF CL(I)>MC THEN MC=CL(I)'EOHH
7030 NEXT'BAEC
7040 A=FN L(MC):S=FN R(MC)
      :SC=20/S'GTQL
7100 FOR I=1 TO NC:REM SCALING'EMVF
7110 PL(I)=CL(I)*SC'CMHF
7120 NEXT'BAEC
7130 A$="FREQUENCY DISTRIBUTION
      "+DF$'CFWM
7140 GOTO 7600'BEKF
7500 FOR I=1 TO NC:REM SCALE
      ACCUM'EPXK
7510 PL(I)=AC(I)*20/NP'DOTK
7520 NEXT'BAEG
7530 S=100:A$="CUMULATIVE FREQUENCY
      "+DF$'DKQR
7600 PRINT"[CLEAR,WHITE,DOWN]"A$:PRINT
      :REM GRAPHING ROUTINE'DTKM
7610 A1$=CHR$(207):FOR I=Ø TO 32
      :A1$=A1$+CHR$(183):NEXT'JBAR
7620 A2$=CHR$(17)+CHR$(157)+CHR$(165)
      :A2$=CHR$(165)+A2$+A2$'KHMU
7630 FOR I=5 TO 1 STEP -1'FELM
7640 PRINT MID$(STR$(I*S/5),2,
      6)TAB(5)A1$'GQXQ
7650 PRINT TAB(5)A2$:NEXT'DGLM
7660 PRINT"Ø"TAB(5)A1$'CFVN
7670 A=1-(NC<17):A$=STR$(MX)'FPOS
7680 PRINT TAB(5)MN TAB(6+A*NC-LEN(A$)
      ) A$ CHR$(150);'IVIW
7700 A3$=CHR$(146)+CHR$(162)'ENML
7710 A4$=CHR$(18)+" "+CHR$(145)+CHR$
      (157)'HRFP
7720 FOR I=1 TO NC'DEAK
7730 IF PL(I)<.1 THEN 7800'DLWN
7740 SYS CR,Ø,22,5+A*I'DLUO
7750 IF PL(I)<1 THEN PRINT A3$
      :GOTO 7800'FOPR
7760 FOR J=1 TO PL(I)'DHKP
7770 PRINT A4$;'BEIO
7780 NEXT'BAEO
7800 NEXT:INPUT"[HOME,YELLOW]
      PRESS RETURN";A$'CERN
7810 PRINT"[CLEAR]":RETURN'CBTJ
8000 MN=Ø:S=100:T=NC:IF A>9 THEN
      8100'GTAI
8020 A$="NORMAL DISTRIBUTION"'BCCI
8030 K1=20:K2=-70:NC=33:M=17'FSRK
8040 FOR X=1 TO NC'DEPG
8050 PL(X)=K1*EXP((X-M)*(X-M)/K2)'HTSO
8060 NEXT:GOTO 8200'CFPI
8100 INPUT"MEAN (1 TO 9)";V
      :IF V<Ø OR V>15 THEN 8100'GMMK
8110 A$="POISSON DISTRIBUTION,
      MEAN"+STR$(V)'DFFM
8120 PL(1)=52*EXP(-V)*SQR(V)'GNEJ
8130 NC=2*V+4:IF NC>33 THEN NC=33'HOSM
8140 FOR X=1 TO NC'DEPH
8150 PL(X+1)=PL(X)*V/X'ENEM
8160 NEXT'BAEH
8200 MX=NC:GOSUB 7600:NC=T:AN=Ø
      :RETURN'FSQJ
9000 I=1:P=21:INPUT"LIST CLASSES
      : SCREEN OR PRINTER S/P";P$'DKJO
9010 IF P$="P" THEN P=NC:OPEN 4,4
      :CMD 4'GLEI
9020 PRINT:PRINT"DATA CLASSES FOR "DF$
      :PRINT'DFFK
9030 IF US THEN PRINT"CLASSES SET
      MANUALLY":PRINT'EDTM
9100 PRINT" CLASS[SPACE3]DATA[SPACE4]
      ACCUMU-"'BAKI
9110 PRINT" START[SPACE2]POINTS
      [SPACE3]LATION"'BAFJ
9120 FOR I=I TO I+P'EEVH
9130 IF I>NC THEN 9200'DHKI
9140 PRINT CM(I)SPC(8-LEN(STR$(CM(I)))
      ) CL(I)SPC(8-LEN(STR$(CL(I))))
      AC(I)'JMTU
9150 NEXT'BAEH
9200 IF P$="P" THEN PRINT#4:CLOSE 4
      :RETURN'GGYI
9210 INPUT"PRESS RETURN";A$:PRINT'CESJ
9220 IF I<NC THEN 9100'DHLI
9230 RETURN'BAQG
```

END



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by Bob and David Snader

Joystick Art
for the Commodore 64


ED SAUK

We wrote Joystick Art in order to make the most of the Commodore 64 keyboard graphics. The available characters are fun to use and are capable of producing quite elaborate screen displays. Joystick Art lets you use the full set of keyboard characters in all colors against various backgrounds and borders. It's all done with a joystick plugged into port #2.

Use the joystick to move a graphic character around the screen and touch the fire button to place it. A menu of useful characters can be placed on the screen by touching "M" on the keyboard. To change characters place the cursor on the desired character and touch "G." Once a character has been used, placing the cursor on that character anywhere on the screen and touching "G" will get that character. Use the menu for new characters or cycle the cursor up or down through the entire set of available characters by touching F1/F7.

Other features of the program are called using the keyboard as follows:

"C," "S" and "B" change the color of the CURSOR, SCREEN and BORDER.

"E" changes the cursor to an ERASER. Touch "E" again and you are returned to the character you were using.

"R" provides the REVERSE of the current character.

"F" and "D" allow you to FILE pictures to, and DRAW pictures from disk.

"G" GETS a new character.

"M" clears a portion of the screen and provides a handy MENU of characters. Touch "M" again to erase the menu.

"H" is for HELP. A portion of the screen is cleared and a reminder is provided of the function of each key. Touch any key to return to your picture.

"SHIFT/CLR" CLEARS the screen.

Our first priority in this version of Joystick Art was to provide as many features and as much versatility as possible while keeping typing to a minimum. To make typing even easier, the disk routines can be removed from the program. This produces a program with all of the described features except the ability to SAVE and DRAW pictures to and from disk. If you don't have a disk drive simply leave out the disk routine in lines 15, 155, 156 and 500-720. ■

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30008, Shreveport, LA 71130-0007, 1-800-831-2694.

Joystick Art

```
10 PRINT"[CLEAR]":X=20:Y=12:A=160:B=14
   :C=54272:S=54296'HGCJ
12 DIM D(160),E(160),F(40),G(40)'BAOE
15 DIM H(1000),I(1000)'BPCF
20 SC=1:POKE 53281,SC:FOR T=0 TO 39
   STEP 2:READ Q,R:F(T)=Q:G(T)=R
   :NEXT'KKLM
30 L=1024+X+40*Y:P=PEEK(L)
   :PC=PEEK(L+C)'JVNK
40 POKE L,A:POKE L+C,B:J=PEEK(56320)
   -100'GUBI
50 GET K$:IF K$="R"THEN A=A+128
   :IF A>255 THEN A=A-256'LUWM
60 IF K$="S"THEN POKE 53281,SC:SC=SC+1
   :IF SC=16 THEN SC=0'KYLO
70 IF K$="C"THEN B=B+1:IF B=16 THEN
   B=0'JLVL
80 IF K$="E"AND A<>35 THEN E=PEEK(L)
   :EC=PEEK(L+C):A=35:GOTO 100'NYIS
90 IF K$="E"AND A=35 THEN A=E
   :B=EC'HLTM
100 IF K$="[CLEAR]"THEN PRINT"[CLEAR]
   "'ECUY
110 IF K$="M"AND F=0 THEN F=1
   :GOTO 320'HKXC
120 IF K$="M"AND F=1 THEN F=0
   :GOTO 400'HKWD
130 IF K$="G"THEN A=P'EEVB
140 IF K$="H"AND F=0 THEN 320'FHIE
150 IF K$="B"THEN POKE 53280,BC
   :BC=BC+1:IF BC=16 THEN BC=0'KYIM
155 IF K$="F"THEN GOSUB 510'EFNI
156 IF K$="D"THEN GOSUB 660'EFRJ
160 IF PEEK(197)=4 THEN A=A+1
   :IF A>127 THEN A=0:GOTO 160'LUEM
170 IF PEEK(197)=3 THEN A=A-1
   :IF A<0 THEN A=127:GOTO 170'LUHN
180 IF J=27 THEN 40'DFAF
190 IF A<>35 THEN 210'EGJH
200 IF J<12 THEN POKE L,32'EHGA
210 IF J<12 THEN POKE S,15:POKE S,0
   :GOTO 230'GPED
220 POKE L,P:POKE L+C,PC'DJOC
230 Y=Y+(J=26 OR J=10):Y=Y+(J=22 OR
   J=6):Y=Y+(J=18 OR J=2)'PFJQ
240 Y=Y-(J=25 OR J=9):Y=Y-(J=21 OR
   J=5):Y=Y-(J=17 OR J=1)'PERR
250 X=X+(J=23 OR J=7):X=X+(J=22 OR
   J=6):X=X+(J=21 OR J=5)'PEFS
260 X=X-(J=19 OR J=3):X=X-(J=18 OR
   J=2):X=X-(J=17 OR J=1)'PELT
270 IF X=<0 THEN X=0'FENH
280 IF X=>39 THEN X=39'FGGI
290 IF Y=<0 THEN Y=0'FEPJ
300 IF Y=>24 THEN Y=24'FGVB
310 GOTO 30'BCKX
320 FOR T=0 TO 160:R=PEEK(1864+T)
   :U=PEEK(56136+T):D(T)=R:E(T)=U
   :POKE 1864+T,32'NUOR
330 POKE 1864+C+T,SC+1:NEXT
```

```
     :IF K$="H"THEN 350'IRCJ
340 FOR T=0 TO 39 STEP 2
     :POKE 1905+T,F(T):POKE 1985+T,G(T)
     :NEXT:GOTO 220'KHOO
350 POKE 214,20:PRINT:PRINT"[GRAY1]
     (M)ENU ON/OFF (G)ET CHARACTER
     (R)EVERSE"'DITP
360 PRINT" (H)ELP ON/OFF[SPACE2]
     (C)OLOR[SPACE4](CLR) CLEAR"'BAUM
370 PRINT"[SPACE2](E)RASE ON/OFF
     [SPACE2](S)CREEN[SPACE3]
     (B)ORDER"'BALN
380 PRINT"[SPACE2]CURSOR (F1/F7)
     [SPACE2]DISK: (F)ILE (D)RAW";'BBUO
390 GET K$:IF K$=""THEN 390'EIGK
400 FOR T=0 TO 160:POKE 1864+T,D(T)
     :POKE 56136+T,E(T):NEXT
     :GOTO 220'JIPK
410 DATA 160,86,87,91,81,102,105,42,
     95,127'BILF
412 DATA 107,113,114,115,101,111,119,
     103,67,66'BMYI
420 DATA 85,74,73,75,97,78,226,77,112,
     109,110'BLSH
425 DATA 125,79,76,80,122,108,124,123,
     126'BHEL
500 REM ***  DISK ROUTINE  ***'BRTD
510 CS=PEEK(53281):CB=PEEK(53280)'ETCG
520 FOR T=0 TO 999:H(T)=PEEK(1024+T)
     :I(T)=PEEK(55296+T)'JFWN
525 POKE 53280,INT(T/50):NEXT'EMLK
530 PRINT"[CLEAR]"'BATD
540 GET P$:IF P$<>""THEN GOTO 540'GIWI
550 INPUT"[HOME,DOWN]PICTURE NAME";
     P$'BDQI
560 IF P$=""THEN GOTO 640'EFWI
570 PRINT"[HOME,DOWN2]FUNCTION
     :(S)AVE (R)EPLACE (E)XIT"'BAKP
580 INPUT"[HOME,DOWN3]FUNCTION[SPACE2]
     S[LEFT3]";F$'BDAN
590 IF F$="R"THEN GOTO 620'EFSL
600 IF F$<>"S"THEN GOTO 640'FFSE
610 OPEN 2,8,2,"0:"+P$+",U,W"
     :GOTO 630'EMLH
620 OPEN 2,8,2,"@0:"+P$+",U,W"'DIJH
630 FOR T=0 TO 999:PRINT#2,H(T)
     :PRINT#2,I(T):NEXT'GUCK
635 PRINT#2,CS:PRINT#2,CB:CLOSE 2'DLBM.
640 FOR T=0 TO 999:POKE 1024+T,H(T)
     :POKE 55296+T,I(T):NEXT'IEAP
650 POKE 53280,CB:RETURN'CJSI
660 PRINT"[CLEAR]":L=1024'CGSJ
670 GET P$:IF P$<>""THEN GOTO 670'GIBM
680 INPUT"[HOME,DOWN]PICTURE NAME";
     P$'BDQM
690 OPEN 2,8,2,"0:"+P$+",U,R"'DIUN
700 FOR T=0 TO 999:INPUT#2,H(T)
     :INPUT#2,I(T):NEXT'GUMI
705 INPUT#2,CS:INPUT#2,CB:CLOSE 2'DLLK
710 FOR T=0 TO 999:POKE 1024+T,H(T)
     :POKE 55296+T,I(T):NEXT'IEAN
720 POKE 53280,CB:POKE 53281,CS
     :RETURN'DSRI
```

END

by M. Poultonavage

Animal
for the Commodore 64 and 128



BOB CLARK

Animal is a guessing game you play with your Commodore 64 or 128 (in 40-column mode). But instead of your computer choosing and you doing the guessing, the situation is reversed. You pick an animal and the computer will try to guess it.

However, you will have to teach your computer. This is a game where your computer will actually "learn" as you continue to play. It will ask questions which you answer with a "yes" or "no." Based on your answers, it will narrow down the choices to guess your animal. If it guesses wrong, it asks you what question it could have asked to differentiate between its guess and your animal. It stores the question and answer to use later and thus "learns."

Now for a little theory. The data structure used by the program is called a binary tree. The program starts with the first question (called the "root"), and based on your answer it follows one of two "branches" (or "pointers") to another question (a "leaf" or "node"). This one has two answers which each lead to another question. The process continues until it reaches a question which is a guess. At this point the program either guesses correctly or needs to learn about a new animal. The tree used by the program is not a "complete" binary tree, because all of its lower "levels" aren't filled. It probably won't always ask the same number of questions before guessing your animal.

I've given you a very small base of animals and questions in the data statements that start at line 9000. You can use them to get started, though reading in a file of animals will write over them. I suggest you choose the option to save the file each time you end the program, or your computer will forget what it has learned. If you like, you can change the data statements, although you must be very careful with the pointers. TR(X,1) points to the next question if the answer to question X is "yes," TR(X,2) is for the "no" answer. The array Q$ holds the questions. I must also warn you to be careful what questions you use. I'm sure you have heard of the acronym GIGO (garbage in—garbage out). If you give the computer inappropriate questions, wrong answers or questions in the wrong order, your computer will accept and use them.

There are two modes of the program available from the title screen. The "play" mode allows you to simply play the game. The other "menu" mode has more options. The menu includes reading and saving the file of animals and playing the game. It also allows you to delete an animal, list the animals the computer knows and list the current set of questions and pointers. ■

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30008, Shreveport, LA 71130-0007, 1-800-831-2694.

Animal

```
100 DIM TR(999,2),Q$(999)'BRJY
117 GOSUB 9000'BEKE
120 PRINT "[CLEAR]":FOR I=0 TO 39
    :POKE 1024+I,102:NEXT'HQPF
125 FOR I=1 TO 24:POKE 1024+I*40,102
    :POKE 1063+I*40,102:NEXT'KEQO
130 FOR I=0 TO 39:POKE 1984+I,102
    :NEXT'GPIE
200 PRINT"[HOME,DOWN2]"
    :PRINT TAB(13)"A N I M A L S"'DEGB
210 PRINT "[DOWN3,RIGHT6]
    PRESS P TO PLAY, M FOR MENU"'BADF
220 GET A$:IF A$="" THEN 220'EIDC
230 IF A$="M" THEN 600'DFTC
240 IF A$<>"P" THEN 220'EFXD
250 P$="Y":GOSUB 500:GOSUB 1000
    :GOSUB 3000:GOTO 700'FUVI
500 PRINT"[CLEAR,DOWN3]
    IS THERE A FILE OF ANIMALS TO
    USE?(Y/N)"'BAAK
510 GET A$:IF A$="" THEN 510'EIFE
520 IF A$="N" THEN 570'DFBE
525 IF A$<>"Y" THEN 515'EFOJ
530 PRINT"[CLEAR,DOWN]INSERT DISK,
     PRESS ANY KEY WHEN READY"'BACN
535 GET A$:IF A$="" THEN 535'EIML
540 OPEN 3,8,3,"0:ANIMALS,S,R"'BGHI
545 INPUT#3,NX'BELJ
550 FOR I=1 TO NX'DEVG
555 INPUT#3,Q$(I),TR(I,1),TR(I,2)'BXHO
560 NEXT:CLOSE 3'CCRG
570 IF P$="Y" THEN RETURN'ECNJ
595 REM  **  MAIN MENU  **'BMTQ
600 PRINT"[CLEAR]":PRINT
    :PRINT TAB(10)"M E N U"'EFCF
605 PRINT:PRINT" 1)[SPACE2]
    READ FILE OF ANIMALS"'CBKM
610 PRINT:PRINT" 2)[SPACE2]
    GUESS AN ANIMAL"'CBLH
615 PRINT:PRINT" 3)[SPACE2]
    DELETE AN ANIMAL"'CBHM
620 PRINT:PRINT" 4)[SPACE2]
    SAVE CURRENT FILE OF ANIMALS"'CBGL
625 PRINT:PRINT" 5)[SPACE2]
    LIST KNOWN ANIMALS"'CBXO
630 PRINT:PRINT" 6)[SPACE2]
    LIST QUESTIONS/POINTERS"'CBNM
640 PRINT:PRINT" 7)[SPACE2]
    END PROGRAM"'CBUJ
650 GET A$:IF A$="" THEN 650'EIKJ
660 ON VAL(A$) GOSUB 530,1000,5000,
    3020,6000,4000,700'DLOO
665 GOTO 600'BDFM
700 END'BACB
990 REM  **  GUESS  **'BJOO
1000 X=1:PRINT"[CLEAR]":PRINT'DEQV
1003 PRINT"THINK OF AN ANIMAL"
     :PRINT "AND I WILL TRY TO GUESS
     IT":PRINT'DCOJ
1005 PRINT"PRESS ANY KEY WHEN YOU'RE
```

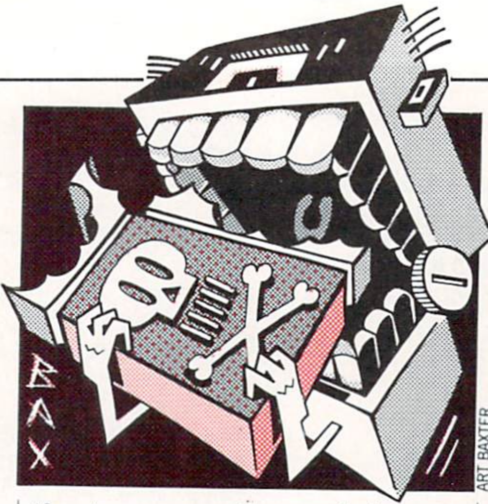
```
     READY":PRINT'CBEH
1010 GET A$:IF A$="" THEN 1010'EJYX
1020 IF TR(X,1)<0 THEN PRINT "IS IT A
     ";Q$(X);"(Y/N)? ";:GOTO 1030'FVBG
1025 PRINT Q$(X);"(Y/N)? ";'BHJD
1030 GET AN$:IF AN$="" THEN 1030'ELHA
1035 IF AN$<>"Y" AND AN$<>"N" THEN
     1030'HKXI
1040 PRINT AN$'BDAX
1045 IF AN$="Y" AND TR(X,
     1) <0 THEN GOSUB 9300
     :GOTO 2100'HUOL
1050 IF AN$="N" AND TR(X,
     2)=0 THEN 2000:REM  ADD TO
     TREE'GAYI
1055 IF AN$="Y" THEN X=TR(X,1)
     :GOTO 1020'FQTK
1060 IF AN$="N" THEN X=TR(X,2)
     :GOTO 1020'FQJG
1065 GOTO 1020'BEAF
1995 REM  **  LEARN  **'BJSS
2000 PRINT"I GIVE UP.[SPACE2]
     WHAT IS YOUR ANIMAL "
     :INPUT A$'CDLD
2005 PRINT:PRINT "WHAT QUESTION
     SHOULD I ASK TO "'CBMI
2007 PRINT"DIFFERENTIATE BETWEEN A ";
     Q$(X):PRINT"AND A ";A$
     :INPUT NQ$'DOJN
2010 PRINT:PRINT"WHAT SHOULD THE
     ANSWER BE FOR YOUR "'CBQF
2012 INPUT "ANIMAL (Y/N)";AN$'BESB
2015 IF AN$="N" THEN 2030'DHUD
2020 Q$(NX)=A$:TR(NX,1)=-1
     :Q$(NX+1)=Q$(X):TR(NX+1,
     1)=-1'IRAL
2025 Q$(X)=NQ$:TR(X,1)=NX:TR(X,2)=NX+1
     :NX=NX+2:GOTO 2100'HPHP
2030 Q$(NX)=Q$(X):TR(NX,1)=-1
     :Q$(NX+1)=A$:TR(NX+1,1)=-1'IRAM
2040 Q$(X)=NQ$:TR(X,1)=NX:TR(X,2)=NX+1
     :NX=NX+2'GKEK
2100 PRINT:PRINT"PLAY AGAIN
     (Y/N)?"'CBHA
2105 GET A$:IF A$="" THEN 2105'EJFE
2110 IF A$="Y" THEN 1000'DGYY
2115 IF A$="N" THEN RETURN'ECME
2120 GOTO 2105'BEFX
2995 REM  **  SAVE FILE  **'BMIU
3000 PRINT"[DOWN]WANT TO SAVE WHAT
     I'VE LEARNED?(Y/N)"'BAVF
3005 GET A$:IF A$="" THEN 3005'EJFE
3010 IF A$="N" THEN 3090'DGYY
3015 IF A$<>"Y" THEN 3005'EGDF
3020 S$=",":PRINT "[CLEAR,DOWN]
     INSERT DISK, PRESS ANY KEY WHEN
     READY"'CDVJ
3025 GET A$:IF A$="" THEN 3025'EJHG
3030 OPEN 3,8,3,"@0:ANIMALS,S,W"'BGCD
3040 PRINT#3,NX'BEGA
3050 FOR I=1 TO NX'DEVC
3060 PRINT#3,Q$(I)S$TR(I,1)S$TR(I,
     2)'BAVH
3070 NEXT'BAEC
3080 CLOSE 3'BBKD
3090 RETURN'BAQE
3990 REM  **  LIST QUESTIONS/PTRS
     **'BWGT
4000 PRINT"[CLEAR]":FOR I=1 TO NX'EFSA
4010 IF Q$(I) <>"" THEN PRINT I;Q$(I);
     TR(I,1);TR(I,2)'FDEG
4020 NEXT'BAEX
4050 PRINT:PRINT"PRESS ANY KEY TO
     CONTINUE"'CBCJ
4055 GET A$:IF A$="" THEN 4055'EJLK
4060 RETURN'BAQC
4990 REM  **  DELETE ANIMAL  **'BQFS
5000 D=0:PRINT"[CLEAR]":PRINT
     :INPUT"ANIMAL TO DELETE";AD$'EJNG
5010 FOR I=1 TO NX'DEVA
5015 IF Q$(I)=AD$ THEN D=I:I=NX'FOGJ
5020 NEXT'BAEY
5025 IF D<>0 THEN 5050'EGLH
5030 PRINT"DOESN'T EXIST"
     :PRINT"PRESS ANY KEY TO
     CONTINUE"'CBUM
5035 GET A$:IF A$="" THEN 5035'EJKJ
5040 RETURN'BAQB
5050 O=0:DP=0:SP=0:PQ=0
     :FOR I=1 TO NX'HTQL
5055 IF TR(I,1)=D OR TR(I,
     2)=D THEN PQ=I:I=NX'HXCR
5060 NEXT'BAED
5100 IF TR(PQ,1)=D THEN DP=1:SP=2
     :GOTO 5110'GVWG
5105 SP=1:DP=2'CHFG
5110 O=TR(PQ,SP)'BKDC
5115 Q$(D)="":TR(D,1)=0:TR(D,2)=0'DXLL
5120 Q$(PQ)=Q$(O):TR(PQ,1)=TR(O,1)
     :TR(PQ,2)=TR(O,2)'DSFM
5130 Q$(O)="":TR(O,1)=0:TR(O,2)=0'DXTI
5150 PRINT:PRINT AD$;" DELETED"
     :PRINT"PRESS ANY KEY TO
     CONTINUE"'DGJP
5155 GET A$:IF A$="" THEN 5155'EJNM
5160 RETURN'BAQE
5990 REM  **  LIST ANIMALS  **'BPTT
6000 PRINT"[CLEAR]":FOR I=1 TO NX'EFSC
6010 IF Q$(I) <>"" AND TR(I,
     1)=-1 THEN PRINT Q$(I)'ISNI
6020 NEXT'BAEA
6050 PRINT:PRINT"PRESS ANY KEY TO
     CONTINUE"'CBCL
6055 GET A$:IF A$="" THEN 6055'EJNM
6060 RETURN'BAQE
8990 REM  INITIAL 'KNOWLEDGE''BSJX
9000 Q$(1)="DOES IT HAVE WINGS"
     :TR(1,1)=2:TR(1,2)=3
     :Q$(3)="DOES IT SWIM"'EELS
9050 TR(3,1)=4:TR(3,2)=5
     :Q$(5)="DOES IT HAVE LEGS"
     :TR(5,1)=6:TR(5,2)=7'FQRW
9105 Q$(2)="DUCK":TR(2,1)=-1'DOJN
9110 Q$(4)="GUPPY":TR(4,1)=-1'DOYJ
9115 Q$(6)="BEAR":TR(6,1)=-1'DOEO
9120 Q$(7)="WORM":TR(7,1)=-1'DOYK
9200 NX=8:RETURN'CEMF
9300 PRINT"I GUESSED YOUR ANIMAL!"
     :RETURN'CBCL
```

END

by Mike Buckley

Heuristic Chomp

for the Commodore 64 and 1351 Mouse



ART BAXTER

This program uses a heuristic algorithm to play the nim-type game of Chomp: it knows the simple rules, but it must learn strategy from experience. It adopts whatever tactics you use; as your skill increases; will the computer's.

Heuristic Chomp is written in BASIC, but it includes a machine language subroutine to get directions from the mouse to move the pointer. The ML code and sprite parameters are poked into memory from DATA statements, so it's a good idea to save the program before running it.

If you're not using a menu or a disk drive, you may prefer to replace the LOAD"MENU", 8 on line 5420 with END or SYS2.

When you run the program, you will be asked to choose a "maximum height" between four and nine. Select a low number if you've never seen the game before, or a high number if you prefer a challenge.

Then you'll see what looks like a small rectangular chocolate bar containing a number of individual pieces. The piece in the northwest corner—the one with the skull and crossbones on it—is poisonous!

Move the pointer to one of the pieces and "chomp" it by pressing the left button. That piece will disappear along with any that are in line directly below it and any that are to the right of that line. (Imagine some square-jawed creature attacking from the southeast, chomping at the selected piece, and removing it along with other pieces that happen to be in the way.)

You and the computer take turns chomping until one of you loses the game by biting the poisonous piece. Then a new game begins with a different sized chocolate bar. You go first in every game.

In general, as you win games, the bar gets larger; if you lose games, it gets smaller. When it reaches maximal size, depending on your initial selection, you are asked if you wish to continue or quit. If you continue, a new series of games begins. It's harder to win the next time around because the computer remembers the winning moves from the previous pass.

The game was invented by the mathematician and economist, David Gale. Martin Gardner named it Chomp in his "Mathematical Games" column for *Scientific American* in January 1973 where he proved that the first player can always win. The proof gives no simple winning formula: in fact Gale believed such a formula would be quite hard to find.

Since the computer always lets you go first, you will be invincible if you are able to work out a winning strategy. ■

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30008, Shreveport, LA 71130-0007, 1-800-831-2694.

Heuristic Chomp

```
10 PRINT"[CLEAR,RVS,GREEN]=*=[SPACE9]
   HEURISTIC CHOMP[SPACE10]=*="
   :RUN 5700'CFOH
300 IF A(U,V)THEN GOSUB 7000
   :RETURN'ELHB
310 IF V=1 THEN X=W'EEDB
320 V=L:RETURN'CDCB
600 IF P THEN PRINT"[HOME,DOWN2,
   L. BLUE,SPACE15,RVS] MY MOVE
   [RVOFF,SPACE5]"'DBHI
610 U=X:V=Y:FOR C=.TO 7:POKE 646,C
   :PRINT"[RVS]";:GOSUB 300:A(U,V)=-1
   :NEXT'LFYO
620 FOR U=X TO W:FOR V=Y TO L
   :GOSUB 300:NEXT:NEXT:RETURN'KODL
900 IF I+J+RND(.)*L*[PI]>S THEN X=I
   :Y=J:S=I+J+RND(.)*L*[PI]'SUWU
910 RETURN'BAQE
1200 IF A(I,J)THEN GOSUB 900
   :RETURN'EKMY
1210 IF I=1 THEN J=L'EEPY
1220 I=W:RETURN'CDAY
1500 S=.:FOR J=1 TO L:FOR I=1 TO W
   :GOSUB 1200:NEXT:NEXT:GOSUB 600
   :RETURN'MWUK
1800 FOR E=.TO 1 STEP.:IF S>T(N)THEN
   IF N<T THEN N=N+1:NEXT'NQHN
1810 IF S=T(N)THEN X=I:Y=J:J=L
   :I=W'HQAL
1820 E=1:NEXT:RETURN'DEVF
2100 IF A(U,V)THEN IF(U<I OR V<J)THEN
   S=S+D:RETURN'KQCF
2110 IF U=1 THEN V=L'EEOY
2120 U=W:RETURN'CDMY
2400 S=.:D=1:FOR V=1 TO L:FOR U=1 TO W
   :GOSUB 2100:NEXT:D=D*10:NEXT
   :RETURN'OBBM
2700 FOR N=.TO T:F=S=T(N)
   :IF S<=T(N)THEN N=T'KSJM
2710 NEXT:RETURN'CBXD
3000 IF A(I,J)THEN GOSUB 2400
   :GOSUB 1800:RETURN'FQUB
3010 IF J=1 THEN I=W'EEBY
3020 J=L:RETURN'CDQY
3300 IF RND(.)>.4 THEN GOSUB 2700
   :IF F THEN GOSUB 1500:RETURN'JQLG
3310 PRINT"[HOME,DOWN2,GRAY2,SPACE12]
   T H I N K I N G[SPACE2]"'BAGF
3320 X=.:N=.'CFJC
3325 FOR I=1 TO W:FOR J=1 TO L
   :GOSUB 3000:NEXT:NEXT
   :IF X>.THEN GOSUB 600:RETURN'OVQS
3330 GOSUB 1500:RETURN'CFBD
3600 PRINT"[HOME,DOWN2,BLACK,SPACE10]
   --> [RVS] YOUR MOVE [RVOFF] <--
   [SPACE11]"'BAGK
3610 FOR E=.TO 1 STEP.:WAIT 56321,16,
   16'FQSI
3615 X=INT((PEEK(53248)-8)/32)+PEEK
   (53264)*8'IXUR
3620 IF X<.THEN NEXT'ECLF
3630 IF X>W THEN NEXT'ECUH
```

Continued on page 100

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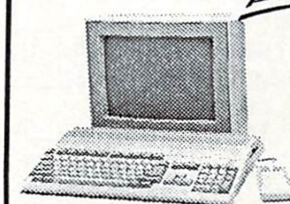
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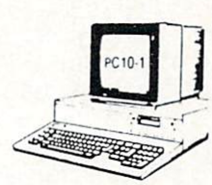
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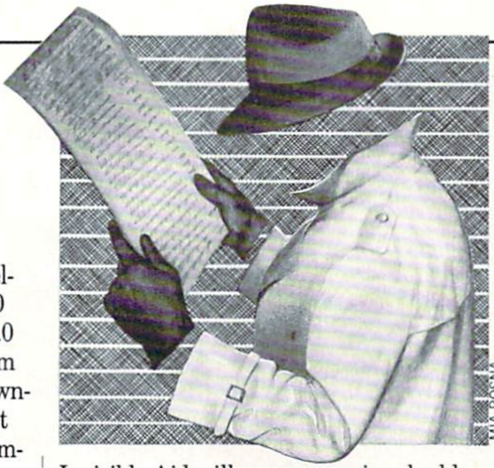
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```
3640 Y=INT((PEEK(53249)-66)/16)
     :IF Y<.THEN NEXT'JTGO
3650 IF Y>H-1 THEN NEXT'FDAJ
3660 E=-A(X,Y):NEXT'DIEK
3665 PRINT"[HOME,DOWN2,SPACE29]"
     :GOSUB 600:RETURN'DFVS
3900 S=T(N):T(N)=T(M):T(M)=S
     :IF N>R THEN N=N-R*2'JCXQ
3910 RETURN'BAQF
4200 IF P THEN PRINT"[HOME,DOWN2,
     PURPLE,SPACE9]I WIN ... PLEASE
     WAIT":RETURN'ECWI
4210 PRINT"[HOME,DOWN2,PURPLE,SPACE8]
     YOU WIN ... PLEASE WAIT"
     :RETURN'CBQI
4500 GOSUB 4200:S(P)=S(P)+1
     :S$=STR$(S(.))+" WIN"
     :IF S(.)-1 THEN S$=S$+"S"'LIPQ
4510 S$=S$+" "+STR$(S(1))+" LOSS"
     :IF S(1)-1 THEN S$=S$+"ES"'KUOP
4520 FOR E=.TO 1 STEP.:IF LEN(S$)<34
     THEN S$=S$+" "'KPEM
4530 IF LEN(S$)<34 THEN S$=" "+S$'GKOK
4540 E=-(LEN(S$)>=34):NEXT
     :PRINT Y$"[RVS,GREEN]=*="S$"=*=";
     'HQGO
4550 IF P=1 THEN W=W-2:IF W<1 THEN W=H
     :L=L-2:IF L<.THEN L=.'PTQU
4560 FOR C=1 TO C(P):FOR N=.TO T
     :IF M(P,C)=T(N)THEN T(N)=T(T):N=T
     :IF T THEN T=T-1'PMJA
4570 NEXT:NEXT:P=1-P:FOR C=1 TO C(P)
     :F=-1:FOR N=.TO T:IF M(P,
     C)=T(N)THEN F=.:N=T'RKGC
4580 NEXT:IF F THEN T=T+1
     :T(T)=M(P,C)'GQUQ
4590 NEXT:R=T:FOR E=.TO 1 STEP.
     :R=INT(R/2):R=R-(INT(R/2)=R/2)
     'PALA
4600 FOR B=1 TO R:FOR N=B TO T-R STEP
     R:M=N+R:IF M<=T THEN IF
     T(N)>T(M)THEN GOSUB 3900'SDIU
4610 NEXT:NEXT:E=-(R=1):NEXT:P=2
     :RETURN'IMUK
4800 IF A(U,V)THEN S=S+D:RETURN'FKSJ
4810 IF V=1 THEN U=W'EEAI
4820 V=L:RETURN'CDCI
5100 IF A(1,1)=.THEN POKE 53269,1
     :GOSUB 4500:RETURN'GUJF
5110 S=.:D=1:FOR U=1 TO W:FOR V=1 TO L
     :GOSUB 4800:NEXT:D=D*10:NEXT
     :C(P)=C(P)+1'PKDQ
5120 M(P,C(P))=S'BKDD
5125 GOSUB 2400:C(P)=C(P)+1
     :M(P,C(P))=S:ON P+1 GOSUB 3600,
     3300:RETURN'INLS
5400 PRINT"[HOME,DOWN2,RVS,BLACK]
     LEFT BUTTON TO CONTINUE -- RIGHT
     TO QUIT"'BAMN
5410 FOR E=-1 TO.STEP.:E=PEEK(56321)
     =255:NEXT:IF PEEK(56321)=239
     THEN RETURN'ODTQ
5420 POKE 53269,.:LOAD"MENU",8'CKYH
5700 FOR A=.TO 53288:READ N
     :IF N>255 THEN A=N:READ N'JSGN
5710 POKE A,N:NEXT:SYS 49408
     :Y$="[HOME,DOWN22]"'ENYL
5720 PRINT"[HOME,DOWN2,GRAY1,SPACE8]
     MAXIMUM HEIGHT (4-9)? ";'BBVO
5730 FOR E=.TO 1 STEP.:GET K$
     :H=VAL(K$):E=-(H>3 AND H<10):NEXT
     :PRINT K$'OBHV
5740 PRINT Y$"[RVS,GREEN]=*=[SPACE7]
     POINT AND CLICK LEFT[SPACE7]
     =*="'BCDR
5750 PRINT"[GRAY3] FROM 'COMMODORE
     MAGAZINE'[SPACE4]JUNE 1987[UP]";
     'BBIU
5760 DIM A(9,8),T(666),M(1,72),C(1),
     S(1):T(.)=1:L=2:POKE 53269,1'EXIW
6000 IF L=H THEN GOSUB 5400
     :L=INT(H/3)+1'INPG
6010 FOR W=L+1 TO H+(L<5)*(H-L*2)'JNEH
6020 POKE 53269,3:PRINT"[BROWN]"
     :FOR J=1 TO L:FOR I=1 TO W
     :A(I,J)=-1'KYIM
6030 PRINT LEFT$(Y$,J*2+3)TAB(I*4-2)"
     [RVS,CMDR A,SHFT *2,CMDR S,DOWN,
     LEFT4,CMDR Z,SHFT *2,CMDR X]
     "'HMGQ
6040 NEXT:NEXT:C(.)=.:C(1)=.
     :FOR P=.TO 2:IF P=2 THEN P=.'LWMN
6050 GOSUB 5100:NEXT:NEXT:L=L+1
     :GOTO 6000'GPDJ
6300 DATA 896,252,,,248,,,240,,,248,,,
     220,,,142,,,7,,,3,,,,,,,,,,,,,,,,
     ,,'BNKN
6310 DATA,,,,,,,,,,,,,,,,,,,,,,,,'BXSG
6320 DATA,252,,49,254,48,49,252,56,
     251,191,124,221,50,224,10,49,64,
     3,207,'BOIP
6330 DATA 1,206,,,180,,1,74,,2,252,,3,
     2,,7,7,,124,3,224'BUPM
6340 DATA 24,1,192,24,1,128,,,,,,,,,,,
     ,,,,,2040,14,15'BSIN
6350 DATA 49408,173,21,3,201,193,240,
     25,8,120,173,20,3'BTTO
6355 DATA 141,,192,173,21,3,141,1'BXYP
6360 DATA 192,169,33,141,20,3,169,
     193'BCRM
6365 DATA 141,21,3,40,96,216,173,25,
     212,172,2,192'BODT
6370 DATA 32,88,193,140,2,192,24,109,,
     208,141,,208,138,105,,41,1,77,
     16'BKDU
6380 DATA 208,141,16,208,173,26,212,
     172,3,192,32'BNJQ
6385 DATA 88,193,140,3,192,56,73,255,
     109'BFTU
6390 DATA 1,208,141,1,208,108,,192,
     140,5,192,141,4,192,162,,56,237,
     5,192'BMAW
6400 DATA 41,127,201,64,176,7,74,240,
     18,172,4,192,96,9,192,201,255,
     240,8,56'BPYP
6410 DATA 106,162,255,172,4,192,96,
     169,,96'BHTJ
6420 DATA 53248,129,107,46,83,53264,,
     53280,,7,53287,1,1'BUXN
7000 PRINT LEFT$(Y$,V*2+3)TAB(U*4-2)"
     [SPACE4,DOWN,LEFT4,SPACE4]"
     :A(U,V)=.:RETURN'JVEN
```

END

by Robert J. Tiess

BASIC 7.0 Invisible Aid



MIA BOSNA

The Commodore 128 has many excellent qualities, including BASIC 7.0 with its extended vocabulary. BASIC 7.0 is a Commodore 64 programmer's dream come true, but those who were not 64 owners and are buying the 128 as their first computer might find this long list of commands somewhat difficult to memorize. Everyone starting out on the 128 finds himself flipping through the pages of the manual trying to recall the name of a command. Beginners who are currently experiencing this will find this program very helpful.

Invisible Aid lists every command the computer recognizes. This listing includes only the command names and not the definitions or examples as in the owner's manual, since listing these would consume a considerable amount of memory. Invisible Aid will serve as an invaluable tool to those who are in the process of creating a BASIC program trying to recall the command they need.

Simply activate Invisible Aid through a SYS address, and the program will list the commands, which the programmer may skim through to find the command he or she cannot think of. The list is arranged alphabetically. To advance from one screen to the next, simply press RETURN. Once the program clears the screen and the READY prompt is visible, you may continue programming. Invisible Aid resides in a location untouched by BASIC and ROM. However, problems may arise if you are tampering with different memory locations. Be very cautious. After you type in the program, be sure to save it so you can load it any time you need it. In order for the program to work properly, without any problems, follow these steps:

1. Turn on the computer.
2. LOAD the BASIC 7.0 Invisible Aid Program.
3. RUN it.
4. Type NEW.

After Step 4 you may continue to load, save and program. To activate Invisible Aid type SYS 6904. Make sure you do not tamper with decimal locations 4864 through 7003, since this is where the entire program is stored, and doing so would most likely cause the computer to crash as you attempt to activate Invisible Aid. ■

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30008, Shreveport, LA 71130-0007, 1-800-831-2694.

BASIC 7.0 Invisible Aid

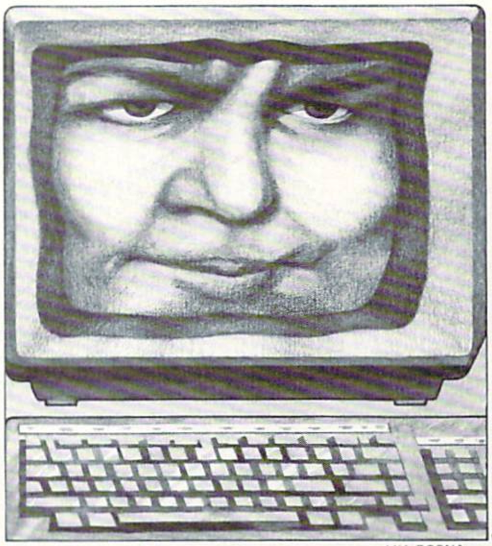
```
1010 GRAPHIC 0,1 : VOL 2'CFCV
1012 COLOR 0,12 : COLOR 4,1
     : COLOR 5,8'DMSB
1014 CHAR 1,2,4,"DATA IS BEING
     PROCESSED.PLEASE WAIT.",1'BIGK
1016 SOUND 1,1000,2 : SLEEP 1'CLBD
1018 FOR A=4864 TO 7003'DJIF
1020 READ A$'BCKU
1022 B=DEC(A$) : C=C+B'EJQB
1024 POKE A,B'BDTA
1026 SOUND 1,INT(RND(.)*(C*.5)),1'FOJH
1028 NEXT : VOL 15'CDCE
1030 IF C<> 67484 THEN BEGIN:'FIDB
1032 PLAY"T0 QCD $EC W#F QG"'BBNC
1034 SCNCLR'BAGA
1036 CHAR 1,3,10,"AN ERROR HAS BEEN
     DETECTED WITHIN"'BHJN
1038 CHAR 1,3,11,"THE DATA
     LINES.PLEASE RECHECK THEM."'BHTP
1040 END'BACW
1042 BEND'BBXA
1044 PLAY "T0 S CEFGGGEEECECGCECGC"'B
     BHI
1046 SCNCLR 0'BBYE
1048 CHAR 1,1,1,"THERE ARE NO ERRORS
     PRESENT WITHIN THE"'BGRR
1050 CHAR 1,1,2,"LINES OF DATA.
     PROGRAM HAS BEEN LOADED"'BGFJ
1052 CHAR 1,1,3,"INTO MEMORY,
      AND MAY BE EXECUTED WITH:"'BGMM
1054 CHAR 1,5,5,"SYS (6904)."'BGVG
1056 END'BACE
1058 DATA 3A,3A,3A,3A,3A,3A,3A,3A,
     3A'BBVL
1060 DATA 3A,3A,3A,3A,3A,3A,3A,3A,
     3A'BBVE
1062 DATA 3A,3A,3A,3A,3A,3A,3A,3A,
     3A'BBVG
1064 DATA 3A,3A,3A,3A,3A,3A,3A,3A,
     3A'BBVI
1066 DATA 3A,3A,3A,3A,3A,3A,3A,12,
     05'BBOK
1068 DATA 13,05,12,16,05,04,3A,13,
     19'BBDM
1070 DATA 13,14,05,0D,3A,17,0F,12,
     04'BBHF
1072 DATA 13,3A,06,0F,12,3A,14,08,
     05'BBJH
1074 DATA 3A,03,31,32,38,3A,3A,3A,
     3A'BBOJ
1076 DATA 3A,3A,3A,3A,3A,3A,3A,3A,
     3A'BBVL
1078 DATA 3A,3A,3A,3A,3A,3A,3A,3A,
     3A'BBVN
1080 DATA 3A,3A,3A,3A,3A,3A,3A,3A,
     3A'BBVG
1082 DATA 3A,3A,3A,3A,3A,3A,3A,3A,
     3A'BBVI
1084 DATA 3A,3A,3A,2D,20,20,01,02,
     13'BBJK
1086 DATA 20,20,20,20,20,03,0F,0C,
     0C'BBOM
1088 DATA 05,03,14,20,20,20,04,16,
     05'BBBO
1090 DATA 12,09,06,19,20,20,07,13,
     08'BBRH
1092 DATA 01,10,05,20,20,20,2D,2D,
     20'BBAJ
1094 DATA 20,01,0E,04,20,20,20,20,
     20'BBEL
1096 DATA 03,0F,0C,0C,09,13,09,0F,
     0E'BBTN
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1098 DATA 20,05,0C,20,20,20,20,20,
     20'BBEP
1100 DATA 20,08,05,01,04,05,12,20,
     20'BBXY
1102 DATA 20,2D,2D,20,20,01,10,10,
     05'BBYB
1104 DATA 0E,04,20,20,03,0F,0C,0F,
     12'BBOD
1106 DATA 20,20,20,20,20,05,0C,13,
     05'BBJF
1108 DATA 20,20,20,20,20,08,05,0C,
     10'BBJH
1110 DATA 20,20,20,20,20,2D,2D,20,
     20'BBYA
1112 DATA 01,13,03,20,20,20,20,20,
     03'BBMC
1114 DATA 0F,0E,03,01,14,20,20,20,
     20'BBBE
1116 DATA 05,0E,04,20,20,20,20,20,
     20'BBIG
1118 DATA 08,05,18,24,20,20,20,20,
     20'BBEI
1120 DATA 2D,2D,20,20,01,14,0E,20,
     20'BBUB
1122 DATA 20,20,20,03,0F,0E,14,20,
     20'BBCD
1124 DATA 20,20,20,20,05,0E,16,05,
     0C'BBGF
1126 DATA 0F,10,05,20,09,06,20,20,
     20'BBRH
1128 DATA 20,20,20,20,2D,2D,20,20,
     01'BBXJ
1130 DATA 15,14,0F,20,20,20,20,03,
     0F'BBHC
1132 DATA 10,19,20,20,20,20,20,20,
     05'BBTE
1134 DATA 12,20,20,20,20,20,20,20,
     09'BBRG
1136 DATA 0E,10,15,14,20,20,20,20,
     2D'BBEI
1138 DATA 2D,20,20,02,01,03,0B,15,
     10'BBXK
1140 DATA 20,20,03,0F,13,20,20,20,
     20'BBHD
1142 DATA 20,20,20,05,12,12,24,20,
     20'BBSF
1144 DATA 20,20,20,09,0E,10,15,14,
     23'BBTH
1146 DATA 20,20,20,2D,2D,20,20,02,
     01'BBXJ
1148 DATA 0E,0B,20,20,20,20,04,01,
     14'BBXL
1150 DATA 01,20,20,20,20,20,20,05,
     18'BBSE
1152 DATA 09,14,20,20,20,20,20,09,
     0E'BBUG
1154 DATA 13,14,12,20,20,20,20,2D,
     2D'BBFI
1156 DATA 20,20,02,05,07,09,0E,20,
     20'BBSK
1158 DATA 20,04,03,0C,05,01,12,20,
     20'BBHM
1160 DATA 20,20,05,18,10,20,20,20,
     20'BBSF
1162 DATA 20,20,09,0E,14,20,20,20,
     20'BBNH
1164 DATA 20,20,2D,2D,20,20,02,05,
     0E'BBVJ
1166 DATA 04,20,20,20,20,04,03,0C,
     0F'BBBL
1168 DATA 13,05,20,20,20,20,06,01,
     13'BBTN
1170 DATA 14,20,20,20,20,20,0A,0F,
     19'BBFG
1172 DATA 20,20,20,20,20,20,2D,2D,
     20'BBYI
1174 DATA 20,02,0C,0F,01,04,20,20,
     20'BBWK
1176 DATA 04,05,03,20,20,20,20,20,
     20'BBPM
1178 DATA 20,06,05,14,03,08,20,20,
     20'BBBO
1180 DATA 20,0B,05,19,20,20,20,20,
     20'BBLH
1182 DATA 20,2D,2D,20,20,02,0F,0F,
     14'BBRJ
1184 DATA 20,20,20,20,04,05,06,20,
     06'BBWL
1186 DATA 0E,20,20,20,20,06,09,0C,
     14'BBJN
1188 DATA 05,12,20,20,20,0C,05,06,
     14'BBPP
1190 DATA 24,20,20,20,20,2D,2D,20,
     20'BBDI
1192 DATA 02,0F,18,20,20,20,20,20,
     04'BBNK
1194 DATA 05,0C,05,14,05,20,20,20,
     20'BBNM
1196 DATA 06,0E,20,20,20,20,20,20,
     20'BBHO
1198 DATA 0C,05,0E,20,20,20,20,20,
     20'BBXQ
1200 DATA 2D,2D,20,20,02,13,01,16,
     05'BBIA
1202 DATA 20,20,20,04,09,0D,20,20,
     20'BBLC
1204 DATA 20,20,20,20,06,0F,12,20,
     20'BBJE
1206 DATA 20,20,20,20,0C,05,14,20,
     20'BBHG
1208 DATA 20,20,20,20,2D,2D,20,20,
     02'BBYI
1210 DATA 15,0D,10,20,20,20,20,04,
     09'BBOB
1212 DATA 12,05,03,14,0F,12,19,20,
     06'BBAD
1214 DATA 12,05,20,20,20,20,20,20,
     0C'BBFF
1216 DATA 09,13,14,20,20,20,20,20,
     2D'BBQH
1218 DATA 2D,20,20,03,01,14,01,0C,
     0F'BBSJ
1220 DATA 07,20,04,0C,0F,01,04,20,
     20'BBEC
1222 DATA 20,20,20,07,05,14,20,20,
     20'BBUE
1224 DATA 20,20,20,0C,0F,01,04,20,
     20'BBWG
1226 DATA 20,20,20,2D,2D,20,20,03,
     08'BBGI
1228 DATA 01,12,20,20,20,20,04,0F,
     20'BBGK
1230 DATA 20,20,20,20,20,20,20,07,
     05'BBRD
1232 DATA 14,23,20,20,20,20,20,0C,
     0F'BBCF
1234 DATA 03,01,14,05,20,20,20,2D,
     2D'BBFH
1236 DATA 20,20,03,08,12,24,20,20,
     20'BBVJ
1238 DATA 20,04,0F,10,05,0E,20,20,
     20'BBCL
1240 DATA 20,20,07,0F,20,36,34,20,
     20'BBVE
1242 DATA 20,20,0C,0F,07,20,20,20,
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    20'BBBG
1244 DATA 20,20,2D,2D,20,20,03,09,
    12'BBII
1246 DATA 03,0C,05,20,20,04,12,01,
    17'BBNK
1248 DATA 20,20,20,20,20,20,07,0F,
    13'BBLM
1250 DATA 15,02,20,20,20,20,0C,0F,
    0F'BBUF
1252 DATA 10,20,20,20,20,20,2D,2D,
    20'BBXH
1254 DATA 20,03,0C,0F,13,05,20,20,
    20'BBCJ
1256 DATA 04,13,20,20,20,20,20,20,
    20'BBNL
1258 DATA 20,07,0F,14,0F,20,20,20,
    20'BBHN
1260 DATA 20,0D,09,04,24,20,20,20,
    20'BBPG
1262 DATA 20,2D,2D,20,20,03,0C,12,
    20'BBSI
1264 DATA 20,20,20,20,04,13,24,20,
    20'BBRK
1266 DATA 20,20,20,20,20,07,0F,20,
    14'BBMM
1268 DATA 0F,20,20,20,20,0D,0F,0E,
    09'BBSO
1270 DATA 14,0F,12,20,20,2D,2D,20,
    20'BBXH
1272 DATA 03,0D,04,20,20,20,20,20,
    04'BBHJ
1274 DATA 13,01,16,05,20,20,20,20,
    20'BBSL
1276 DATA 07,12,01,10,08,09,03,20,
    20'BBCN
1278 DATA 0E,05,17,20,20,20,20,20,
    20'BBMP
1280 DATA 2D,00,00,00,00,00,00,00,
    00'BBNI
1282 DATA 00,00,00,00,00,00,00,00,
    38'BBCK
1284 DATA 39,3A,3B,3C,3D,3E,3F,3A,
    3A'BBDM
1286 DATA 3A,3A,3A,3A,3A,3A,3A,3A,
    3A'BBVO
1288 DATA 3A,3A,3A,3A,3A,3A,3A,3A,
    3A'BBVQ
1290 DATA 3A,3A,3A,3A,3A,3A,3A,3A,
    3A'BBVJ
1292 DATA 3A,3A,3A,3A,3A,3A,3A,3A,
    3A'BBVL
1294 DATA 3A,3A,3A,3A,3A,12,05,13,
    05'BBIN
1296 DATA 12,16,05,04,3A,13,19,13,
    14'BBDP
1298 DATA 05,0D,3A,17,0F,12,04,13,
    3A'BBWR
1300 DATA 06,0F,12,3A,14,08,05,3A,
    03'BBIB
1302 DATA 31,32,38,3A,3A,3A,3A,3A,
    3A'BBGD
1304 DATA 3A,3A,3A,3A,3A,3A,3A,3A,
    3A'BBVF
1306 DATA 3A,3A,28,03,0F,0E,14,09,
    0E'BBWH
1308 DATA 15,05,04,29,3A,3A,3A,3A,
    3A'BBRJ
1310 DATA 3A,3A,3A,3A,3A,3A,3A,3A,
    3A'BBVC
1312 DATA 3A,2D,20,20,20,0E,05,18,
    14'BBEE
1314 DATA 20,20,20,20,12,05,0E,15,
    0D'BBEG
1316 DATA 02,05,12,20,13,10,03,20,
    20'BBPI
1318 DATA 20,20,20,20,14,12,0F,06,
    06'BBQK
1320 DATA 20,20,20,20,2D,2D,20,20,
    20'BBYD
1322 DATA 0E,0F,14,20,20,20,20,20,
    12'BBCF
1324 DATA 05,13,14,0F,12,05,20,20,
    13'BBSH
1326 DATA 10,12,03,0F,0C,0F,12,20,
    14'BBVJ
1328 DATA 12,0F,0E,20,20,20,20,20,
    2D'BBTL
1330 DATA 2D,20,20,20,0F,0E,20,20,
    20'BBSE
1332 DATA 20,20,20,12,05,13,15,0D,
    05'BBPG
1334 DATA 20,20,20,13,10,12,04,05,
    06'BBUI
1336 DATA 20,20,20,15,0E,14,09,0C,
    20'BBJK
1338 DATA 20,20,20,2D,2D,20,20,20,
    0F'BBTM
1340 DATA 10,05,0E,20,20,20,20,12,
    05'BBJF
1342 DATA 14,15,12,0E,20,20,20,13,
    10'BBMH
1344 DATA 12,09,14,05,20,20,20,15,
    13'BBEJ
1346 DATA 09,0E,07,20,20,20,20,2D,
    2D'BBFL
1348 DATA 20,20,20,0F,12,20,20,20,
    20'BBFN
1350 DATA 20,20,12,07,12,20,20,20,
    20'BBQG
1352 DATA 20,20,13,10,12,13,01,16,
    20'BBRI
1354 DATA 20,20,15,13,12,20,20,20,
    20'BBQK
1356 DATA 20,20,2D,2D,20,20,20,10,
    01'BBWM
1358 DATA 09,0E,14,20,20,20,12,09,
    07'BBBO
1360 DATA 08,14,24,20,20,20,13,11,
    12'BBAH
1362 DATA 20,20,20,20,20,20,16,01,
    0C'BBFJ
1364 DATA 20,20,20,20,20,20,2D,2D,
    20'BBYL
1366 DATA 20,20,10,05,05,0B,20,20,
    20'BBFN
1368 DATA 20,12,0E,04,20,20,20,20,
    20'BBGP
1370 DATA 20,13,13,08,01,10,05,20,
    20'BBUI
1372 DATA 20,16,05,12,09,06,19,20,
    20'BBMK
1374 DATA 20,2D,2D,20,20,20,10,05,
    0E'BBUM
1376 DATA 20,20,20,20,20,12,12,05,
    07'BBTO
1378 DATA 20,20,20,20,20,13,14,20,
    20'BBOQ
1380 DATA 20,20,20,20,20,16,0F,0C,
    20'BBBJ
1382 DATA 20,20,20,20,20,2D,2D,20,
    20'BBYL
1384 DATA 20,10,0C,01,19,20,20,20,
    20'BBHN
1386 DATA 12,13,10,03,0F,0C,0F,12,
    20'BBUP
1388 DATA 13,14,01,13,08,20,20,20,
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     20'BBVR
1390 DATA 17,01,09,14,20,20,20,20,
     20'BBYK
1392 DATA 2D,2D,20,20,20,10,0F,09,
     0E'BBTM
1394 DATA 14,05,12,20,12,13,10,10,
     0F'BBMO
1396 DATA 13,20,20,20,13,14,05,10,
     20'BBSQ
1398 DATA 20,20,20,20,17,08,09,0C,
     05'BBXS
1400 DATA 20,20,20,20,2D,2D,20,20,
     20'BBYC
1402 DATA 10,0F,0B,05,20,20,20,20,
     12'BBXE
1404 DATA 13,10,12,09,14,05,20,20,
     13'BBBG
1406 DATA 14,0F,10,20,20,20,20,20,
     17'BBMI
1408 DATA 09,04,14,08,20,20,20,20,
     2D'BBWK
1410 DATA 2D,20,20,20,10,0F,13,20,
     20'BBAD
1412 DATA 20,20,20,12,15,0E,20,20,
     20'BBIF
1414 DATA 20,20,20,13,14,12,24,20,
     20'BBTH
1416 DATA 20,20,20,17,09,0E,04,0F,
     17'BBTJ
1418 DATA 20,20,20,2D,2D,20,20,20,
     10'BBXL
1420 DATA 0F,14,20,20,20,20,20,12,
     17'BBOE
1422 DATA 09,0E,04,0F,17,20,20,13,
     17'BBVG
1424 DATA 01,10,20,20,20,20,20,18,
     0F'BBJI
1426 DATA 12,20,20,20,20,20,20,2D,
     2D'BBAK
1428 DATA 20,20,20,10,12,09,0E,14,
     20'BBNM
1430 DATA 20,20,13,01,16,05,20,20,
     20'BBSF
1432 DATA 20,20,13,19,13,20,20,20,
     20'BBVH
1434 DATA 20,20,0D,0F,16,13,10,12,
     20'BBEJ
1436 DATA 20,20,2D,2D,20,20,20,10,
     12'BBYL
1438 DATA 09,0E,14,23,20,20,13,03,
     01'BBSN
1440 DATA 0C,05,20,20,20,20,14,01,
     02'BBGG
1442 DATA 20,20,20,20,20,20,20,20,
     20'BBJI
1444 DATA 20,20,20,20,20,20,2D,2D,
     20'BBYK
1446 DATA 20,20,10,15,04,05,06,20,
     20'BBVM
1448 DATA 20,13,03,0E,03,0C,12,20,
     20'BBAO
1450 DATA 20,14,01,0E,20,20,20,20,
     20'BBFH
1452 DATA 20,20,20,20,20,20,20,20,
     20'BBJJ
1454 DATA 20,2D,2D,20,20,20,12,03,
     0C'BBSL
1456 DATA 12,20,20,20,20,13,03,12,
     01'BBNN
1458 DATA 14,03,08,20,20,14,05,0D,
     10'BBRP
1460 DATA 0F,20,20,20,20,20,20,20,
     20'BBEI
1462 DATA 20,20,20,20,20,2D,2D,20,
     20'BBYK
1464 DATA 20,12,04,0F,14,20,20,20,
     20'BBKM
1466 DATA 13,07,0E,20,20,20,20,20,
     20'BBKO
1468 DATA 14,08,05,0E,20,20,20,20,
     20'BBPQ
1470 DATA 20,20,20,20,20,20,20,20,
     20'BBJJ
1472 DATA 2D,2D,20,20,20,12,05,01,
     04'BBEL
1474 DATA 20,20,20,20,13,09,0E,20,
     20'BBMN
1476 DATA 20,20,20,20,14,09,20,20,
     20'BBTP
1478 DATA 20,20,20,20,20,20,20,20,
     20'BBJR
1480 DATA 20,20,20,20,2D,2D,20,20,
     20'BBYK
1482 DATA 12,05,03,0F,12,04,20,20,
     13'BBOM
1484 DATA 0C,05,05,10,20,20,20,20,
     14'BBJO
1486 DATA 09,24,20,20,20,20,20,20,
     20'BBUQ
1488 DATA 20,20,20,20,20,20,20,20,
     2D'BBES
1490 DATA 2D,20,20,20,12,05,0D,20,
     20'BBBL
1492 DATA 20,20,20,13,0C,0F,17,20,
     20'BBEN
1494 DATA 20,20,20,14,0F,20,20,20,
     20'BBHP
1496 DATA 20,20,20,20,20,20,20,20,
     20'BBJR
1498 DATA 20,20,20,2D,2D,20,20,20,
     12'BBAT
1500 DATA 05,0E,01,0D,05,20,20,13,
     0F'BBXD
1502 DATA 15,0E,04,20,20,20,20,14,
     12'BBNF
1504 DATA 01,10,20,20,20,20,20,20,
     20'BBHH
1506 DATA 20,20,20,20,20,20,20,2D,
     00'BBCJ
1508 DATA 00,00,00,00,00,00,00,00,
     00'BBQL
1510 DATA 00,00,00,00,00,00,AD,00,
     13'BBHE
1512 DATA 8D,00,04,EE,F9,1A,EE,FC,
     1A'BBJH
1514 DATA AD,F9,1A,D0,EF,EE,FA,1A,
     EE'BBAJ
1516 DATA FD,1A,AD,FA,1A,C9,17,D0,
     E2'BBSL
1518 DATA A2,13,A0,04,8E,FA,1A,8C,
     FD'BBKN
1520 DATA 1A,20,E4,FF,C9,0D,D0,F9,
     AD'BBKG
1522 DATA 00,17,8D,00,04,EE,28,1B,
     EE'BBTH
1524 DATA 2B,1B,AD,28,1B,D0,EF,EE,
     29'BBGK
1526 DATA 1B,EE,2C,1B,AD,29,1B,C9,
     1B'BBAM
1528 DATA D0,E2,A2,17,A0,04,8E,29,
     1B'BBQN
1530 DATA 8C,2C,1B,20,E4,FF,C9,0D,
     D0'BBRH
1532 DATA F9,A9,93,20,D2,FF,60'BUKH
```

END



MIA BOSNA

by Jerome E. Reuter

Template Maker

for the Commodore 64 and 128

Have you ever put a game or utility into your computer and while using it, pressed the wrong function key? Sure, we all have. The worst situation is when you press the save or load function and the screen demands a filename and there is no way to back out of the prompt. Asking all the programmers in the world to adopt one standard wouldn't work because all programs have different needs.

The 128 can compound the problem—because it is so easy to re-define the function keys, you may have pressed the wrong function key on a program that you wrote yourself.

The suggestions from other readers range from label guns to typing a 3x5 card to put into the disk jacket with the floppy. The second idea can be improved upon with Template Maker.

Template Maker will take your input and print out a small neat mask to surround the offending keys and stow inside the jacket cover.

The program is written entirely in BASIC and welcomes your own modifications. After typing it in, save a copy to disk or tape and RUN. The first screen asks you to input the type of printer you are using. (MPS is the default answer and will work on almost every printer that can print the little graphics on the front of the keys.) Change MPS to DPS and press RETURN, and you can now use the dot-matrix printers that do not support the graphic keys and the daisy wheel impact printers. The other set-up question determines which computer you are making the mask for. (The default here is the 128, but you can change it to 64 if your computer has the wider style keys.) Remember the 128 has narrow keys even when you're running a 64 program. You can also make a template for any of the gang of four keys along the top of your 128 if your software utilizes the ALT, ESC or HELP keys.

The rest of the operation is very simple, just enter your data to label the keys to match the program. The entry routine uses the INPUT command and restricts the use of the line deliminators such as commas, but will print everything else. After the input for all eight keys is complete, you are given a chance to make corrections. (Seeing the label on the screen will often suggest a change or two.)

The templates can be printed on colored paper if you have a color filing system, (green for games, yellow for utilities, etc.). Two templates glued back to back make a durable, reversible template with your boot up values on one side and your favorite word processor on the other. ■

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30008, Shreveport, LA 71130-0007, 1-800-831-2694.

Template Maker

```
10 DIM ZZ$(12),B$(12):A$=":":E=6:F=13
   :G=20:H=27:M=8:PRINT"[CLEAR,BLUE]"
   :D1$="[DOWN5]"'JPCM
20 POKE 53280,13:POKE 53281,13
   :D2$=D1$+D1$+D1$:GOSUB 600
   :REM DRAW TEMPLATE'HWAM
30 INPUT"[BLACK,DOWN3] FOR [RVS]64
   [RVOFF] OR [RVS]128[RVOFF]
    COMPUTER [RIGHT4,RVS]128[LEFT6] ";
   AA$'BEHN
35 REM WHICH COMPUTER IS THE TEMPLATE
   FOR - NOT WHICH MODE ARE YOU
   IN.'BBDT
40 IF AA$<>"128" THEN M=12
   :REM 64=WIDER'GPNI
50 INPUT"[UP] USING WHICH PRINTER (
   [RVS]MPS[RVOFF]/[RVS]DPS[RVOFF])
   [RIGHT3,RVS]MPS[LEFT6] ";PR$'BEQR
60 IF PR$="MPS"THEN M=M-2
   :A$="[SHFT -]"'GJTJ
70 PRINT"[UP] READY THE PRINTER,
    THEN PRESS [RVS]*[RVOFF,SPACE6]
   "'BAUN
80 GET C$:IF C$<>"*"THEN 80'FHJI
90 FOR K=1824 TO 1863:POKE K,32
   :NEXT'FPSL
100 OPEN 4,4:FOR A=1 TO 12:READ ZZ$(A)
    :NEXT:A=0'HTRD
110 PRINT"[HOME,DOWN4]"D2$:A=A+1'DHKY
120 B$(A)="":PRINT"[SPACE2,BLACK,RVS,
    SPACE2]KEY[SPACE2,RVOFF]";ZZ$(A)
    :INPUT"[GREEN]";B$(A)
    :GOSUB 690'EYVH
130 ON A GOTO 140,150,160,170,180,190,
    200,210,220,230,240,250'CXUI
140 PRINT"[HOME,RVS]"TAB(E)D1$B$(A)
    :GOTO 260'DOLD
150 PRINT"[HOME,RVS,DOWN]
    "TAB(E)D1$B$(A):GOTO 260'DODE
160 PRINT"[HOME,RVS]"TAB(F)D1$B$(A)
    :GOTO 260'DOMF
170 PRINT"[HOME,RVS,DOWN]
    "TAB(F)D1$B$(A):GOTO 260'DOEG
180 PRINT"[HOME,RVS]"TAB(G)D1$B$(A)
    :GOTO 260'DONH
190 PRINT"[HOME,RVS,DOWN]
    "TAB(G)D1$B$(A):GOTO 260'DOFI
200 PRINT"[HOME,RVS]"TAB(H)D1$B$(A)
    :GOTO 260'DOOA
210 PRINT"[HOME,RVS,DOWN]
    "TAB(H)D1$B$(A):GOTO 260'DOGB
220 PRINT"[HOME,RVS]"TAB(E)D2$B$(A)
    :GOTO 260'DOMC
230 PRINT"[HOME,RVS]"TAB(F)D2$B$(A)
    :GOTO 260'DOND
240 PRINT"[HOME,RVS]"TAB(G)D2$B$(A)
    :GOTO 260'DOOE
```

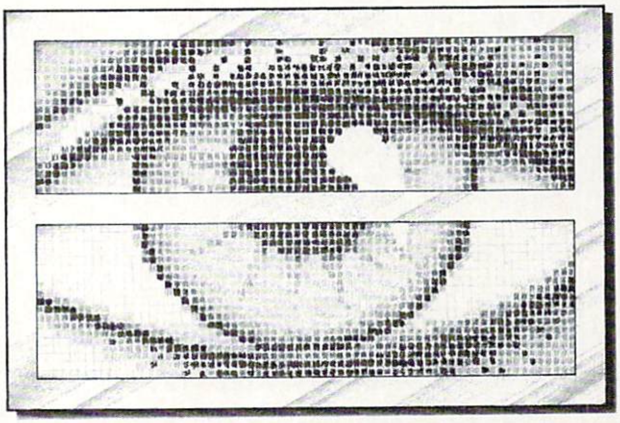
```
250 PRINT"[HOME,RVS]"TAB(H)D2$B$(A)
    :GOTO 260'DOPF
260 FOR K=1864 TO 1903:POKE K,32
    :NEXT'FPRI
270 IF A<12 THEN 110'DGBG
280 INPUT"[BLACK,DOWN4,RVS]
     ANY CHANGES TO BE MADE [RIGHT4]N
    [LEFT3]";AN$'BEJO
290 IF AN$<>"N"THEN GOSUB 1000
    :GOTO 110'GLIL
300 IF PR$="MPS"THEN GOTO 490'EGTB
310 OPEN 10,4,10:PRINT#10:CLOSE 10
    :GOSUB 440:GOSUB 460
    :GOSUB 460'GAXG
320 PRINT#4,CHR$(27)+CHR$(68),A$;
    SPC(6)B$(1);B$(3);B$(5);B$(7);
    SPC(7)A$'GTYL
325 GOSUB 460'BDNF
330 PRINT#4,CHR$(27)+CHR$(68),A$;
    SPC(6)B$(2);B$(4);B$(6);B$(8);
    SPC(7)A$'GTDM
335 GOSUB 460'BDNG
340 GOSUB 470:FOR X=1 TO M'EHPF
350 PRINT#4,CHR$(27)+CHR$(68),A$;
    SPC(5);A$;SPC(28);A$;SPC(6);A$
    :NEXT'IIAN
360 GOSUB 470:GOSUB 460'CHLF
370 PRINT#4,CHR$(27)+CHR$(68),A$;
    SPC(6)B$(9);B$(10);B$(11);B$(12);
    SPC(7)A$'GWMR
380 GOSUB 460:GOSUB 440:CLOSE 4'DJWI
390 INPUT"[UP] WANT ANOTHER PRINTED
    (YES/NO)[RIGHT4]YES[LEFT5]";
    AN$'BEOU
400 IF AN$<>"YES"THEN PRINT"[CLEAR]"
    :END'GEKE
410 IF AN$="YES" THEN GOSUB 1100'EHRD
420 IF AN$<>"YES" THEN RUN'FDXE
430 IF AN$="YES" THEN OPEN 4,4
    :GOTO 300'FKUH
440 PRINT#4,CHR$(27)+CHR$(68),
    "--------------------";'EMRK
445 PRINT#4,"----------------------"
    'BCAM
450 RETURN'BAQD
460 PRINT#4,CHR$(27)+CHR$(68),A$,
    SPC(21),A$:RETURN'GVPL
470 PRINT#4,CHR$(27)+CHR$(68),A$;
    SPC(5);"---------------";'FSKO
475 PRINT#4,"-----------------------
    ------";SPC(6);A$'CIJS
480 RETURN'BAQG
490 OPEN 10,4,10:PRINT#10:CLOSE 10
    :OPEN 6,4,6:PRINT#6,CHR$(21)
    :CLOSE 6'HDJQ
500 PRINT#4,"[CMDR A,SHFT *41,CMDR S]"
    :GOSUB 560'CGMI
510 GOSUB 560:PRINT#4,A$;SPC(6)B$(1);
    B$(3);B$(5);B$(7);SPC(7)A$
    :GOSUB 560'FSYL
520 PRINT#4,A$;SPC(6)B$(2);B$(4);
    B$(6);B$(8);SPC(7)A$:GOSUB 560
    :GOSUB 570'FSEM
530 FOR X=1 TO M:GOSUB 580:NEXT
    :GOSUB 590:GOSUB 560
    :GOSUB 560'IUUK
540 PRINT#4,A$;SPC(6)B$(9);B$(10);
    B$(11);B$(12);SPC(7)A$
    :GOSUB 560'ERTN
550 PRINT#4,"[CMDR Z,SHFT *41,CMDR X]"
    :CLOSE 4:GOTO 390'DIKO
560 PRINT#4,A$,SPC(21),A$:RETURN'DMUJ
570 PRINT#4,A$;SPC(5);"[CMDR A,
    SHFT *28,CMDR S]";SPC(6)A$
    :RETURN'EOQI
580 PRINT#4,A$;SPC(5);A$;SPC(28);A$;
    SPC(6);A$:RETURN'FYWO
590 PRINT#4,A$;SPC(5);"[CMDR Z,
    SHFT *28,CMDR X]";SPC(6);A$
    :RETURN'EPHL
600 PRINT"[CLEAR,RVS,BLACK]
     TEMPLATE MAKER - BY JEROME E.
    REUTER[SPACE2]":PRINT:PRINT'DCIN
610 FOR X=1 TO 5:GOSUB 680:NEXT'FIGF
620 PRINT"[RVS,GREEN,SPACE6,RVOFF,
    BLACK,SHFT U,SHFT *5,SHFT I,
    SHFT U,SHFT *5,SHFT I,SHFT U,
    SHFT *5,SHFT I,SHFT U,SHFT *5,
    SHFT I,GREEN,RVS,SPACE5]"'BARC
630 PRINT"[RVS,GREEN,SPACE6,RVOFF,
    BLACK,SHFT -] F/1 [SHFT -2] F/3
    [SHFT -2] F/5 [SHFT -2] F/7
    [SHFT -,GREEN,RVS,SPACE5]"'BADR
640 FOR X=1 TO 2:PRINT"[RVS,GREEN,
    SPACE6,RVOFF,BLACK,SHFT -,SPACE5,
    SHFT -2,SPACE5,SHFT -2,SPACE5,
    SHFT -2,SPACE5,SHFT -,GREEN,RVS,
    SPACE5]":NEXT'FFQU
650 PRINT"[RVS,GREEN,SPACE6,RVOFF,
    BLACK,SHFT -] F/2 [SHFT -2] F/4
    [SHFT -2] F/6 [SHFT -2] F/8
    [SHFT -,GREEN,RVS,SPACE5]"'BAHT
660 PRINT"[RVS,GREEN,SPACE6,RVOFF,
    BLACK,SHFT J,SHFT *5,SHFT K,
    SHFT J,SHFT *5,SHFT K,SHFT J,
    SHFT *5,SHFT K,SHFT J,SHFT *5,
    SHFT K,GREEN,RVS,SPACE5]"'BALF
670 FOR X=1 TO 3:GOSUB 680:NEXT
    :RETURN'GJXM
680 PRINT"[RVS,GREEN,SPACE39]"
    :RETURN'CBMO
690 IF LEN(B$(A))>7 THEN
    B$(A)=LEFT$(B$(A),7):RETURN'HXMS
700 IF LEN(B$(A))<7 THEN
    B$(A)=B$(A)+"-"'GSLI
710 IF LEN(B$(A))<7 THEN
    B$(A)="-"+B$(A)'GSLJ
720 IF LEN(B$(A))<7 THEN 700'ELPH
730 RETURN'BAQE
740 DATA" F1 (TOP LINE)",
    " F1 (BOT LINE)"'BBKM
745 DATA" F3 (TOP LINE)",
    " F3 (BOT LINE)"'BBOR
750 DATA" F5 (TOP LINE)",
    " F5 (BOT LINE)"'BBSN
755 DATA" F7 (TOP LINE)",
    " F7 (BOT LINE)"'BBWS
760 DATA" F2 ( 1 LINER )",
    " F4 ( 1 LINER )"'BBLN
765 DATA" F6 ( 1 LINER )",
    " F8 ( 1 LINER )"'BBTS
1000 FOR K=1824 TO 1863:POKE K,32:NEXT
     :PRINT"[UP3]":A=0:RETURN'IURD
1100 INPUT"[UP]USING THE SAME LABELS
     (YES/NO)[RIGHT4]YES[LEFT5]";AN$
     :RETURN'CFAJ
```

END

by John Iovine

Interfacing Commodore's User Port, Part 6

Building a Digital Camera, Part 3 (cont'd)



MIA BOSNA

In our May issue we ran the 128 listings for this article. This month we publish the 64 versions to conclude our project "Building a Digital Camera."

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30008, Shreveport, LA 71130-0007, 1-800-831-2694.

64 Hi-Res Camera

```
10 PRINT"[CLEAR]"'BATX
20 PRINT:PRINT"[DOWN4]MAIN MENU"'CBYC
30 PRINT:PRINT'CBHA
35 PRINT"[SPACE2]1) LOAD HI-RES
   CAMERA"'BAWK
36 PRINT"[SPACE2]2) CHANGE TIMING OF
   CAMERA"'BARM
37 PRINT"[SPACE2]3) START CAMERA"'BAJK
38 PRINT"[SPACE2]4) QUIT"'BAIJ
39 FOR T=1 TO 255:NEXT'EGEL
40 POKE 197,64:POKE 198,0'CMGD
41 INPUT"ENTER CHOICE (1-4)";X'BCPG
42 IF X <1 OR X>4 THEN PRINT"PLEASE
   ENTER NUM. BETWEEN 1 & 4"
   :GOTO 41'HHXP
43 ON X GOTO 360,300,152,350'CQGH
150 REM DIGITAL CAMERA CONTROL
    HI-RES'BBEH
152 G=PEEK(53272):H=PEEK(53265)'ERPI
155 POKE 53272,PEEK(53272)OR 8'DOUJ
160 SYS 49344'BFPC
180 POKE 53272,G:POKE 53265,H'CPLH
200 GOTO 10'BCIV
300 PRINT"[CLEAR]"'BATX
301 PRINT:PRINT'CBHY
302 PRINT"TIMING PROGRAM" :PRINT'CBUE
303 D=PEEK(49490):F=PEEK(49492)'ERYG
304 PRINT"OUTER TIMING LOOP IS SET AT
    ";F :PRINT'CDMK
306 PRINT"INNER TIMING LOOP IS SET AT
    ";D :PRINT'CDQM
307 INPUT"ENTER NEW INNER TIMING";D
    :PRINT'CDUL
308 INPUT"ENTER NEW OUTER TIMING";F
    :PRINT'CDLN
309 POKE 49490,D:POKE 49492,F'CPUK
310 GOTO 10'BCIX
350 END'BACC
354 PRINT"[CLEAR,DOWN2]
    DIGITAL CAMERA IS ALREADY IN
    MEMORY"'BASQ
355 PRINT"DO NOT RELOAD OR ERROR IN
    DATA STATEMENT WILL RESULT"'BAXV
356 PRINT"PRESS ANY KEY TO REURN TO
    MAIN MENU"'BAFS
357 GET K$:IF K$=""THEN 357'EIJN
358 GOTO 10'BCIK
360 IF PZ=1 THEN 354'DGPG
363 PRINT"[CLEAR]":PRINT"[DOWN2]
    LOADING HI-RES CAMERA"'CBUN
364 FOR I=49152 TO 49715:READ A
    :POKE I,A'FRIN
365 B=B+A:NEXT:PZ=1'EINM
366 IF B<>60182 THEN PRINT"ERROR IN
    DATA STATEMENTS":END'GHCU
367 PRINT"[DOWN3]LOAD SUCESSFUL,
    ..RETURNING TO MAIN MENU"'BARV
368 FOR T=1 TO 999:NEXT:GOTO 10'FJFP
370 DATA 000,001,004,005,002,003,006,
    007,008,009'BOTL
380 DATA 012,013,010,011,014,015,016,
    017,020,021'BOPM
390 DATA 018,019,022,023,024,025,028,
    029,026,027'BODN
400 DATA 030,031,032,033,036,037,034,
    035,038,039'BOYF
410 DATA 040,041,044,045,042,043,046,
    047,048,049'BOEH
420 DATA 052,053,050,051,054,055,056,
    057,060,061'BOAI
430 DATA 058,059,062,063,065,064,000,
    001,069,068'BOOJ
440 DATA 004,005,067,066,002,003,071,
    070,006,007'BOQJ
450 DATA 073,072,008,009,077,076,012,
    013,075,074'BOML
460 DATA 010,011,079,078,014,015,081,
    080,016,017'BOBL
470 DATA 085,084,020,021,083,082,018,
    019,087,086'BOSN
480 DATA 022,023,089,088,024,025,093,
    092,028,029'BOSO
490 DATA 091,090,026,027,095,094,030,
    031,097,096'BOUP
500 DATA 032,033,101,100,036,037,099,
    098,034,035'BOCH
510 DATA 103,102,038,039,105,104,040,
    041,109,108'BOSH
520 DATA 044,045,107,106,042,043,111,
    110,046,047'BOUI
530 DATA 113,112,048,049,117,116,052,
    053,115,114'BODJ
540 DATA 050,051,119,118,054,055,121,
    120,056,057'BOAL
550 DATA 125,124,060,061,123,122,058,
    059,127,126'BOEM
560 DATA 062,000,169,032,013,017,208,
    141,017,208'BOYM
570 DATA 169,032,133,252,162,064,169,
    000,133,251'BOGO
```

```
580 DATA 168,145,251,200,208,251,230,
     252,228,252'BOHP
590 DATA 176,245,162,250,169,001,202,
     157,000,004'BODP
600 DATA 157,250,004,157,244,005,157,
     238,006,208'BONI
610 DATA 241,076,000,193,255,000,255,
     000,255,000'BOSI
620 DATA 255,000,255,000,255,000,173,
     002,220,141'BOIJ
630 DATA 047,021,169,255,141,003,221,
     120,169,011'BOBK
640 DATA 141,002,220,160,000,162,000,
     169,011,141'BOBL
650 DATA 000,220,185,000,192,141,001,
     221,169,009'BOQM
660 DATA 141,000,220,169,001,141,000,
     220,189,064'BOON
670 DATA 192,141,001,221,169,000,141,
     000,220,169'BOPO
680 DATA 008,141,000,220,169,009,141,
     000,220,232'BOJP
690 DATA 224,128,208,225,162,000,200,
     192,064,208'BOAR
700 DATA 202,076,081,193,076,021,194,
     162,002,160'BOGJ
710 DATA 008,136,208,253,202,208,248,
     234,160,000'BOBK
720 DATA 162,000,169,011,141,000,220,
     189,000,192'BOQK
730 DATA 141,001,221,169,009,141,000,
     220,185,064'BOUL
740 DATA 192,141,001,221,206,000,220,
     173,013,221'BOFM
750 DATA 201,016,208,119,076,006,194,
     200,192,128'BOIO
760 DATA 208,227,160,000,232,224,064,
     240,191,234'BODO
770 DATA 076,096,193,142,048,194,134,
     255,140,049'BOFQ
780 DATA 194,132,253,006,253,234,169,
     248,037,253'BOYR
790 DATA 141,051,194,165,255,041,007,
     013,051,194'BOFS
800 DATA 168,169,000,133,252,169,248,
     037,255,010'BOTK
810 DATA 038,252,010,038,252,010,038,
     252,133,251'BOBK
820 DATA 165,255,074,074,074,024,101,
     254,105,032'BOGM
830 DATA 101,252,133,252,096,165,253,
     041,007,170'BODN
840 DATA 232,169,000,056,106,202,208,
     252,017,251'BOEN
850 DATA 145,251,096,165,253,041,007,
     170,232,169'BORP
860 DATA 000,056,106,202,208,252,073,
     255,049,251'BODQ
870 DATA 145,251,096,032,147,193,032,
     209,193,174'BOXR
880 DATA 048,194,172,049,194,076,131,
     193,032,147'BOES
890 DATA 193,032,227,193,174,048,194,
     172,049,194'BOKT
900 DATA 076,131,193,173,047,194,141,
     002,220,088'BOOL
910 DATA 165,197,201,017,240,003,076,
     038,194,096'BOVM
920 DATA 120,169,011,141,002,220,076,
     017,193,255'BODM
930 DATA 063,127,000,255'BPBJ
```

END

What's Online Locally

Continued from page 77

will be exactly what you are looking for in a terminal program. At first, I'd suggest staying with a simpler terminal program until you have mastered all its commands. When you feel comfortable with your modem and software you can check into a terminal with more features.

Be sure your first terminal program is compatible with your type of modem. In other words, be sure it was made to operate with your modem. Most popular terminal programs are compatible with several modems, so finding one to work with yours shouldn't be difficult. You also need to find software that will let you upload and download files from the BBS. An upload or download is called a file transfer. File transfers are conducted using various protocols. These protocols are guidelines that the sending and receiving computers use to control the flow of data from one machine to the other. Some popular file transfer protocols in use on bulletin boards are Xmodem, Xmodem CRC and Punter. Be sure the terminal program you choose supports one or more of these popular protocols.

Another feature you'll find useful in a terminal program is a buffer. A buffer is an area of your computer's memory set aside by your terminal software for storing information for later use. For instance, you can capture everything that comes across your screen, like a large number of messages or a long text file, and save it to view once you log off. Or you may want to save the contents of your buffer to disk or dump it to your printer for a more permanent record. Some terminal programs will allow you to send the contents of your buffer to the BBS. This will allow you to prepare a message offline and then upload it to the BBS when you log on. One crucial point to remember when working with the data in your buffer: Once you turn your computer off, the contents of your buffer will be forever lost. So be sure to save the contents of your buffer on disk or print it out on your printer to retain any valuable information.

Other features you may want your terminal program to have are automatic dialing, with automatic redialing of busy numbers, an online clock with a timer or alarm so you can tell how long you have been online. Another useful feature is a DOS command section that will let you manipulate files, scratch, rename, copy or even format new disks.

Connecting

Once you have the required hardware and software, you'll be just about ready to go online. All you have to do now is connect your modem to your computer and the phone line, load your terminal program and dial the number. If you bought a modem made specifically for your Commodore computer, then all you need to do is plug the modem into the user port. If the modem is not machine specific and was not made with the proper connectors to mate with the connector on your computer, then you will need to purchase an interface. Many people use the popular Hayes-compatible modems designed to use the standard RS-232C connector and then find out that their Commodore computer does not have an RS-232C port. If this is the case, don't worry, there are several high quality RS-232C interfaces available through local computer stores.

Once the modem is connected to the computer you need to connect it to a

phone line via standard modular phone cords. One end attaches to your modem and the other plugs into the phone jack. Most modems will also have another jack which is used to plug a telephone into. This phone can be used when the modem is not in use.

Once you have your modem connected properly, all you have to do is load your terminal program and set the parameters or configuration for your type of modem. Just load and run your terminal program, and it will show you a menu. Choose the command corresponding to the change parameters or configuration settings from the menu. The next menu you should see will have commands to change modem type, along with other options. Choose your modem type. Next you will have to set your baud rate. If yours is a 300 baud modem, setting this option to 1200 or 2400 will not give you more speed. In fact it will make your modem inoperable. On the other hand if you have a 1200 or 2400 baud modem setting the terminal to a lower baud rate will cause your modem to operate at the slower speed. Other parameters you may need to set include your duplex, word length, parity and stop bits. Don't let the terminology confuse you. You don't have to know what each of these terms means to be able to use your modem. Just remember the standard settings for each of these. These settings should work with any bulletin board you call: Set your duplex to full, an eight-bit word length, no parity and one stop bit.

Let's take a moment to look at duplex settings. When you call a BBS the duplex should be set to full. If you are calling another computer, say a friend's computer, the duplex should be set to half. If the duplex is not set properly, you'll know. If you're on a BBS and the duplex is set improperly then anything you type will be echoed back to you. If you type "A" you'll see "AA." If you are online with a friend and your duplex is not set correctly, then you won't be able to see anything you type.

Once you have all the terminal parameters set, you are ready to dial up your local BBS. If your terminal program has an autodialer then just choose that option from the main menu. Most terminal programs will allow you to add phone numbers to a list of numbers to dial and will dial one of them upon your command. Others may just ask you for the number to dial. You then type in the number of the BBS you want to call, and the terminal program dials it for you. If you use one of the Hayes-compatible modems you can dial a number by choosing the terminal mode option from the main menu, and entering a command from the keyboard. To enter the command to dial you simply type "ATDP xxx,xxxx." "AT" in the command gets the modem's attention. The "DP" tells the modem to dial a pulse-type telephone. "xxx" is the first three numbers of the phone number, the comma will pause for two seconds, and "xxxx" is the last four digits of the phone number. To dial a touch tone phone you simply replace the "P" in "ATDP" with a "T" as in "ATDT". To hang up a Hayes modem you type "+ + +". Three plus signs in a row with a one-second pause after them will disconnect you from the BBS or computer you are connected to.

> Online games on local BBSs in my area include trivia games, guess the word/phrase-type games, tic-tac-toe and Battleship-style games.

If your modem does not have an auto-dial feature, you have to dial the number on your telephone and then unplug your phone and plug in your modem. I mention this only for people who may have an older modem, as even the most inexpensive modems sold today will auto-dial.

Online

When you dial the number the bulletin board's modem will pick up the phone and send an answer tone. The high pitched tone is called a "carrier." When your modem hears this answer tone it will send an originate signal and the connection is made. Once you are connected, the BBS will begin sending information to your terminal. Some bulletin boards may wait for you to hit RETURN once or twice before they start sending. This information is usually a welcome message giving the board's name and may include some information about the board. At the end of this message you will be asked to log on.

If this is your first time calling, you won't have an account established, so you will need to get one before you can use the BBS. Most bulletin boards will let you enter the word "new" to log on temporarily. You will then be shown a file that tells you how to ask for an account, what information the sysop needs, etc. Some BBSs may ask new users to simply press RETURN. After pressing RETURN you will be told how to request an account.

I've found that most bulletin boards require you to register by mail. The sysop will usually ask for your address and phone number, and then will either call or send you an application by mail. This verification is done to prevent people from logging on under different names and hogging the system. Once you have spoken to the sysop and/or returned the application, you will be given access to the board.

Now that you have an account, it's time to log on and explore the board. When you log on with your new account, you'll be shown some text files that are meant for the new user, and the sysop will usually leave a private welcome message for you. At this point it may be a good idea to open your buffer and capture the information in these files, so once you log off you can review the files and command menus to become more familiar with the rules and commands of the board. After these messages you will see a main menu. If no main menu appears, typing in a question mark or "help" will usually give you a full list of commands. Entering the listed commands will allow you to access the message bases, view the upload and download libraries, log off the BBS and perform other functions while online. Let's look at some of these commands more closely. One very important thing to keep in mind as we discuss these main menu commands is the fact that the command structure of each BBS may be different. It depends on the software the sysop uses and/or any changes the sysop may have made to the BBS program. While these commands differ from board to board, I can still give you some idea of what to expect.

Message Base Commands

One of the commands found at the main menu level will allow you to enter the message bases to read and post messages. You choose this option by pressing the key that corresponds to the command character listed on the menu. When you enter the message bases you will be shown another menu or command line prompt. If you just get a prompt, try typing a question mark or "help" again. The message base commands usually look like this:

R — Read Messages
N — Read New Messages
F — Read Forward
B — Read Backward
S — Send Message

Most of these commands are self explana-

tory with the exception of Send Message. If you choose this option, the BBS will ask you to whom the message is to be sent. Enter the user name of the person for whom the message is intended. The BBS will also usually let you enter "all" as the user name to send an open message for all to see. If you entered the name of a user you will usually be asked if the message is private or public. After you enter your choice you will be told to begin typing your message, and the BBS will tell you some way to let it know you're finished typing. It will say something like "Enter RETURN on a blank line when finished," or "Type /s when done." When you indicate you are through typing you will be shown a message editor menu that will allow you to correct any typing errors you made while entering the message. When you are satisfied with the message the last thing you need to do is save it. Up to this point the text of your message has been stored in the BBS's memory. Entering the command to save or send the message will store the message on disk where it will wait to be read.

While reading messages you may be given the opportunity to reply to the message you have just read. At the end of the message will be a small command line with options for you to reply to the message, read the message again, quit reading or return to the main menu. Choosing the reply command will take you to the enter message area with the message already addressed to the person to whom you wish to reply. After entering and editing the message you save it, and you are returned to reading messages where you left off.

Upload/Download Commands

At the main menu you'll also see an option to take you to the upload and download libraries. Choosing this option will show you the download library menu. The download menu will be similar to this:

V — View Files
D — Download Files
U — Upload Files
C — Change Library
M — Main Menu

The view command will let you see what files are available to download. They will be listed with the filenames, file length, file type and perhaps a short description of the file. The download command tells the BBS you want to download a file. When you choose this option you will be asked to enter the name of the file you want to download. The board will then search the directory and retrieve the file. Once the BBS is ready it will ask you to set your terminal for download. When your terminal is ready the file will be transferred to your disk.

The upload command works much the same way to send a file to the BBS. The command to change the protocol can be found on boards that support more than one transfer protocol. Your terminal program and the bulletin board must be set to use the same protocol before the transfer can begin. For instance if your terminal is set to use the Punter protocol and the bulletin board is set for the Xmodem protocol, you won't be able to transfer the file. In this case you can use the change protocol and the transfer can begin. If your terminal uses only a protocol the BBS doesn't support, you will have to change terminal programs before you can up/download.

One other command you may see is a command to change the download library. On most bulletin boards the files for downloading are stored according to program or computer type. You may see a list of libraries like this:

1 Utilities
2 Applications
3 Games
4 Music/Graphics
5 Telecommunications
6 Text Files

Choosing from this list will let you change from one library or directory to another. Then you can use the view files command to see the files in the current directory.

Reading Text Files

You may find a library listing set aside for text files. From this list of text files you can choose one to read online or download. You may download these just like any other file. To read these online you can download them with the ASCII protocol. This protocol will simply display the file to your screen. If you want to save the file just open your buffer, and the file will be stored in your buffer as it scrolls across the screen. Some BBSs will automatically set the protocol to ASCII for text files, and once you enter the filename the text will begin scrolling immediately. If you want to pause the text, most boards will allow you to enter a series of keystrokes to pause the scrolling. On most boards pressing CONTROL/P will pause the text. Pressing CONTROL/R will resume the scrolling. If you decide not to finish reading the file press CONTROL/S to stop the file and return to the last menu you saw. These commands will usually work wherever you may be on the board.

Other options you may see at the main menu will allow you to check your time online, go to the game section or chat with the sysop. When you choose the chat option the BBS will beep in the sysop's home to get his attention. If the sysop doesn't answer after a few seconds, you will be returned to the main menu. If the sysop hears the page he will break into the BBS program, and you can type your message to him on your keyboard. His reply to you will be shown on your screen as he types the reply. Another option you may see is the Feedback to sysop command. This command will let you enter a private message to the sysop. A message left here will usually result in a speedy reply, so this is the place to leave questions you may have concerning the operation of the BBS, your account, etc.

Another command will let you log off (leave) the BBS. Once you choose this command most boards will ask if you are sure. After you type "Y," it will ask if you want to leave a private message to the sysop. If you answer "Y" again, you can enter a private message to the sysop after which you are logged off. Typing "N" at this prompt will log you off without leaving feedback to the sysop. You should always leave the BBS through this option and never just unplug the phone line from your modem while you are at a menu on the BBS. The reason is that some bulletin boards recover very well from losing a carrier suddenly, while some boards will lock up if you drop a carrier at the wrong time. If the BBS locks up, it will not answer calls from other users and will wait for the sysop to restart the BBS. Needless to say this is not the way to stay on the best side of the sysop.

If the cost of accessing online information services is too much for your pocket, don't give up hope. The services I mentioned are just a few of those provided by local BBSs. Local bulletin boards are constantly growing, acquiring new members, and adding new features. If the sysop cares about his or her users, then the board is usually in a perpetual state of change. Bulletin boards are popping up overnight, so your chances of finding one nearby are always increasing. If you can't tolerate the idea of paying those monthly charges, or you panic when you think of the phone bill, then take some time to look around. Online enjoyment may be closer than you think.

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enemies. One enemy shot will finish Pinky for good.

Using the bomb is the more risky method of attack. If you choose this form of attack, your car will drive past the targeted building while you attempt to lob a bomb through the second-story window where a gangster is standing nearby. If you miss the first time, you can decide to try it again. But on a second pass, the enemy gangster will be ready and waiting for you. If you miss this time, the enemy mug will blow Pinky away.

In other parts of the game you may suddenly find yourself confronted with an enemy who is only a few feet away. As you might guess, you will now be forced to pull the trigger before he does if you wish to live.

The graphics and sounds live up to the Cinemaware tradition, even if they don't surpass it. The characters' faces are very detailed and colorful, and they are also animated—eyes blink, tears flow, faces snarl and lips move. Backdrops and props decorate each scene and give an authentic 1930s feel to the game.

There is no digitized speech in the game to accompany the thought balloons, probably because it would take more memory than the average Amiga user has. Still there are many sound effects in the game, and most are quite good. The gun shots almost seem to reach out and hurt you!

The best configuration for playing *King of Chicago* is 1MB of memory and two floppy drives (you can lack one or the other and still play the game, but *not* both!). Those who have 1MB of memory do enjoy a few extra thrills, like "spinning newspaper" scenes, plus a colorful intermission scene when you take a break.

Unfortunately, you cannot save a game in progress, but at least you can pause it. The only problem I found was that the Bankroll figure doesn't seem to change to reflect the net profit/loss figures for each month's payroll. The only time I've seen it change at all was when Pinky bet at the crap tables. Otherwise the game seems bullet-proof.

One final note: if you are worried that the game isn't very complex, let me point out that Cinemaware says that there are over one billion possible combinations of events. Even though I have won the game more than once, I still occasionally find Pinky in a scene that I have never come across before. *King of Chicago* is a movie that you might be willing to give a rave review! C

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time you access the spell checker. If it finds enough room, it will allow you to move the speller to RAM: before checking a document. This friendly feature (providing you have more than 512K) makes checking a lengthy document fast and simple, since the program can access RAM much faster than a floppy disk. Each time the checker finds a word it doesn't recognize, it allows you to either accept it as correct, correct the word yourself, or choose another word by scrolling through a list of words with similar spellings. The spell check tests only the words following the cursor, so you can use it to check an entire document, a portion or just a single word. As a poor speller myself, I was pleased with *KindWords*' spell checking speed and logic.

Now for the bad news. There are few free lunches when it comes to word/graphic processors. I found *KindWords* slow to respond to some commands. There are short, but noticeable delays when major changes are made to text, fonts are switched, etc. At first these pauses (usually less than two seconds) are bearable, but when your fingers are trying to keep up with your thoughts they can be irritating. To be fair, most word processors slow a bit in insert mode because the screen below the new text has to be reformatted as it is pushed down. But this hesitation is much more noticeable with *KindWords*. As new text is added, the different fonts and graphics have to be redrawn, which takes time. Thus, it is easy to out-pace the cursor when inserting text. The solution I found to this dilemma was to type any large areas of text to be inserted at the end of the screen (where nothing had to be redrawn) and then copy it to the new location.

Except for its lack of speed, I found *KindWords* both powerful and flexible. Too often power is paid for with complexity, but this isn't true of *KindWords*—the program is very easy to use. Even using the program's powerful tools like adding graphics or foreign/symbol characters is as simple as selecting the feature from a pull-down menu. The program is so logically designed, only a mini manual (54 pages) written in easy to understand language is required to store all the instructions. I think most users will be delighted with *KindWords*' logical design, power and many features. Plus it is priced very competitively. With all that going for it, it was easy for me to find some kind words for *KindWords*. C

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are nicely integrated with the Corps' history and provide a wide range of different battles scattered around the world.

To supplement the manual a large foldout playfield map, several charts outlining the menus, and even labels to put on game disks are also enclosed in a very professional package.

All of the icons and program functions are detailed at some point in the manual or on the map legend. However, there is no overall summary, so again you spend a great deal of time flipping through the pages until you become familiar with all aspects of the game. It would be preferable to have all of this information collected in one reference section. An index would also have been helpful.

Modifications

The long-term play value of *Halls of Montezuma* is greatly improved by the ability to personalize just about all aspects of the game. Two special programs are provided to help with this.

Warplan is a construction set that lets you redefine all play aspects of the game, such as the maps and scenarios, the strength and deployment of your troops, and so on. The description of each scenario in the manual contains hints on how historic battles could be staged under different rules. When you get tired of redefining history, you can create new scenarios all your own.

The second program, called Warpaint, is a graphics editor that lets you change the appearance and colors of the many icons that make up the game. Do you want to create a scenario that resembles the scenery around your own home? Warpaint gives you the tools you need.

A game in progress can be saved to a data disk at any time. It is then possible to use Warpaint and Warplan to modify the game. The changed game can then be reloaded and continued.

Your Choice

For the serious user, the game offers sophisticated entertainment that requires a high degree of concentration. The eight scenarios, plus countless customized variations, offer the opportunity to delve into war strategy almost without limit.

At the same time, *Halls of Montezuma* is not for everyone. This is a game that demands a high degree of commitment from the user. You will need several days of use to become proficient, along with a lot of concentration whenever you play. ■

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There are several different types of units, each with different attributes. Infantry units, for example, have the lowest attack/defense values. However, they are very effective in forests—they move better than most other units and also get a defense modifier of three times the defense base while in the forests. Armor or tank units have the highest attack values of all, especially with regard to the German Armor units. However, they move very slowly through wooded hexes and can never cross rivers unless an undamaged bridge is present.

The Germans enjoy a special advantage over the Allies. In addition to the normal terrains of Mountain, Forest, Plain and City hexes, there are also special hexes occupied by the well-known Siegfried Line. Allied troops may *never* enter these hexes. All German troops have their defense values tripled while in these hexes.

Another important aspect of the game is supplying the units. Each unit must remain supplied by a friendly fuel dump, otherwise its attack/defense and movement ratings will start to decrease. Armor units are the most drastically affected by being isolated from supply lines, while Infantry units aren't usually severely affected when they are cut off from supplies. How far a unit can wander from a supply road and still be considered "supplied" depends on the value of the fuel dump supplying the unit. When you successfully attack a fuel dump via aerial bombardment attacks, you don't blow it up immediately, but you reduce its supply value. The supply value states in hexes how far a supplied unit can be from the road.

Another factor that can come into play during the game is the demolition of bridges, which can prevent the powerful Armor units from moving across rivers and cause all other units to spend an extra turn to cross the river. However, blown-up bridges can be rebuilt by other units, so if you want to prevent the enemy from crossing a river you must first blow up the bridge and then remain there for as long as possible.

The best feature of *Blitzkrieg at the Ardennes* is the digitized sounds. If you have a stereo hooked to your Amiga and turn up the volume, the explosions and other sounds add realism to the game that just can't be matched by other computers.

Although the graphics do make the game pieces and other landmarks stand out clearly and help make complex engagements relatively easy to figure out, they are not up to the Amiga standard. The forests hexes look more like clumps of grass, and the mountains look like piles of dirt. Only the fuel dumps and the representations of each unit look like what they are supposed to represent.

Even worse than the graphics is the user interface. The gadgets in the load/save screen and the control screen are inferior to most public domain programs. The menu set in the main program is as disorganized as it can get. Fortunately, they do have command-key sequences for all the menu options, so mouse haters don't have to be tortured. Instead of having instant scrolling that is easily possible with the power of the Amiga, it takes over a second to move the screen at all, and then it only moves a distance of one hex. If this weren't bad enough, many times when you are trying to pull down the menu, your pointer will hit the top of the screen by mistake (to scroll the high resolution, you have to touch one of the edges of the screen with your pointer), and the game will move the view for you instead of displaying the menu. I found this *very* frustrating in the beginning.

The manual is almost as disorganized as the menu set, and there is neither a table of contents nor an index. The only good thing I have to say about the manual is that all the probability tables used to determine solutions to an engagement or another event are included. This makes strategy a bit easier to plan.

Many of these problems are due to the fact that Command Simulations tried to fit all aspects of the game in only 512K of memory. However, they are working on an update to *Blitzkrieg* that will take advantage of expansion memory—their next simulation will be designed for use with 1MB of memory.

In summary, *Blitzkrieg at the Ardennes* is a valiant effort to bring a strategic simulation to the Amiga that really tries to take advantage of the Amiga. The digitized sounds, complexity and powerful movement functions make the game both challenging and not too tough to work with. Command Simulations still needs to improve some areas of the game, like the user interface, the manual and the scrolling. Despite its problems, *Blitzkrieg at the Ardennes* still blows away any eight-bit simulation port. I don't know about you, but I would rather play an Amiga simulation game written exclusively for the Amiga that has some problems than a eight-bit simulation game ported to the Amiga any day. ■

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Championship Wrestling: If your energy is about to be depleted, take refuge on the top turnbuckle, where your opponent cannot harm you. When your energy returns, wait until your opponent starts running around just below you. Jump on him, and his energy will be depleted by half or more.
Khang Nguyen
Tacoma, WA

Commando: For infinite lives, load the game, reset the computer, then enter:

POKE 2454,234 <RETURN>
POKE 2455,234 <RETURN>
POKE 2456,234 <RETURN>
SYS 2128 <RETURN>

Adrian Zenker
Buenos Aires, Argentina

Crystal Castles: This game has many "warps" to advance you to higher levels. The first is on level 1. Disappear in the back-left corner and press the fire button. The computer will play a little music, and you will find yourself on level 3!

Waste no time there, because there's another warp. Wear the fire-hat, hop on the elevator, and go to the third floor. Disappear to the back-left corner and press the fire button. (Do it very fast so you don't lose the hat.) Before you can say "Commodore," the music will play and you'll warp to level 5.

Play through that level and the next one until you get to Crossroads. Lure the tree down from its starting position, jump at the top-back corner (without hat or disappearing) and you'll be transported to level 7. Play on until you've lost all your men and died.

When you restart, you'll see a black door on level 1. Disappear in it and press the fire button, and you'll be taken to where you left off.

Finally, when the little green critters are stealing the gems and they are flashing red, you can eat them just by rushing into them.
Michael L. Gatto
Los Angeles, CA

Defender of the Crown: The way you begin tells if you are going to win or not. To begin well, don't buy more soldiers at the start of the game. Transfer one or two soldiers, and move your small army around the empty countries until all are taken. Return to your Garrison, waiting until you have enough money for at least 40 soldiers and a catapult.

Now attack the castle at the far right, where you will have a 50-50 chance of winning the battle. If you win, the rest of the game is a breeze.
Daron Rainer
Plano, TX

Destroyer: If you are on the anti-aircraft guns and your ammunition is low, go to the other gun (even if it is damaged), then quickly return. You'll be full of ammo and ready to go.
Lorne Jee
Powell River, British Columbia
Canada

Donkey Kong: On the first screen, quickly climb up and down the first broken ladder, then jump to the right. If you do it correctly, it will appear that Mario has jumped through the floor. The second screen will be displayed and you will have gotten all the bonus points. It just proves you can monkey around with these computer games.
Troy Rouillard
Address Unknown

Elite: The radar readout on the Cobra MK III is a very high-tech piece of equipment, showing not only target positions but also their type. Ships, cargo pods, escape pods and alloys are yellow. Missiles and space stations are green. Asteroids are pink.
Jiles D. McCoy
Greenville, AL

F-15 Strike Eagle: Once you have destroyed the enemy bases, bomb your own base. You'll get points and will complete your mission.
Nam Tang
Dallas, TX

Flight Simulator II: When doing the WWI Flight Ace simulation, it's hard to stay level while coming in low enough for a good bombing run. You can cheat by landing at the target, taxiing onto it and dropping your bomb. It's as easy as one, two, three!
Jiles McCoy
Greenville, AL

Gauntlet: Find a death and decrease your health to under 200. Touching the death, keep your fire button pressed to shoot at it. You'll die and the death will disappear. You'll be stunned and cannot move, but your health will go up to 9935, letting you move once again. All the walls will then turn into exits.

Keep away from the edges of the screen, or you'll be whisked away.
Aaron Schnuth
Swanton, OH

Goonies: To see all the game screens, press F5 then F7. Release F5 then F7, and the game will load the next screen. Repeat until satisfied.
Steve Rohatynsky
Winnipeg, Manitoba
Canada

Green Beret: This will give you a few extra men in your fight against your enemies (255, to be exact):

POKE 4556,255 <RETURN>
POKE 6908,238 <RETURN>
RUN <RETURN>

Glenn Taylor
Algonac, MI

Gunship: In any of the four difficulty levels, always fly low—below 1500 feet, or below 500 feet if you can handle it. This makes it harder for the radar on the enemy tanks and SAMs to lock onto you.

After each mission, always inspect your helicopter, then push the "quit this mission" icon. This brings faster promotions and decorations.
Donovan Botelho
Victorville, CA

Hardball: The statistics are merely numbers, which don't apply to real hitting. The batting order is the real key to abilities. The All Stars have a bunch of good hitters. The Champs are poorer hitters, but they are fast.

The first batter for the All Stars has good speed. Batting order 1,7,8,9 can't hit the ball out of the park. Batting order 2,3,4,5,6 can—these are the people who produce runs.

For the Champs, their 1,2,9 men have great speed, but 3,4,5,9 produce runs. Batters 1,2,6,7,8 are poor hitters. Batter 6 often hits into double plays because of his speed.
Cheuk Chau
Chico, CA

Impossible Mission: When you find the room with a huge door on the bottom-left side (it looks like a picture frame), that is where to go after you solve the puzzle.

In the rooms with checkerboards, you can get extra snooze and lift pieces by pressing the buttons so the musical tones go from lowest to highest pitch.
James Reese
Address Unknown

Into the Eagle's Nest: The first prisoner is in the basement, the second is on the first floor, and the third is on the second floor.

Ammunition is a problem on the second floor of the first castle. To solve it, go to the right as soon as you get off the elevator, and never go to a new floor without 99 ammunition. Shoot the detonators to activate them.
Robert Mikre
Upper Montclair, NJ

Karateka: On the second level entering the castle, a bird comes out before each new guard, and he takes two arrows unless you defeat him. When the music warns he's coming, try switching to keyboard mode. This will give you an advantage, since keyboard is more responsive than the joystick.
Jay Locklear
Address Unknown

Kung Fu Master: For infinite lives, POKE 38649,189.
Patrick Thibault
St-Nicolas, Quebec
Canada

Leaderboard: If you're having trouble loading this game using the Fast version, try typing this:

LOAD "FAST50",8,1 <RETURN> The program should load quickly, but without a title screen.
Evan Davis
Edgeworth, New South Wales
Australia

Legacy of the Ancients: In the castle, there will be a small room with a chest in it. Do not open this chest! It will bring you 100 gold, but will also attract guards who are licensed to kill.

Also, stock up on magic spells before entering the castle or any dungeon.
Gabe Meline
Santa Rosa, CA

Mario Bros: These spots are safe from all but the green zaps that shoot across the screen: behind the intakes at the bottom of the screen and on the second platform from the top.

Here's a trick to try when one of the brothers stands under the middle of the hole at the top of the screen after the other has died. When the other brother appears at the top and drops down, he will bounce off the lower brother's head. If the lower brother jumps at this time, the dropping one will travel much further.
Robert Earle Perkins
Address Unknown

Motormania: When you first start out, go to the left of the intersection, proceeding until you can't see yourself (be sure not to go too far). Go full speed without moving the joystick left or right, and you'll pass everything, even rocks, cars, ambulances, etc.
Brett Caldwell & Chris Walsh
Mesa, AZ

Nodes of Yesod: This game should be mapped on a 16 (West-East) by 15 (North-South) grid. One screen should equal one square on the paper.
Shukri Berisha
Address Unknown

Pirates: Keep your party pleased or happy by finding a hidden treasure. (Pleased/happy pirates do not desert.) Once you've found a treasure, go to a nearby town and sign up some more men to join your happy band.
Phil Greco
Address Unknown

Project: Space Station: If you didn't land on the runway, avoid applying the brakes; otherwise you'll damage them and extend your repair time.

To pause the game, just go to the HELP screen.

If you feel the controls are hard on the EVA screen, simply use the joystick upside down.

If the message indicator flashes, and the date shown is the launch date, go to the LAUNCH screen and press F7 while the message is appearing. There will be no problems on the countdown.

If you go to the LAUNCH screen and the weather is not favorable, exit and enter again.

Always keep at least one shuttle on the ground. If both are in space and a solar flare occurs, the crews could perish and you'll have no way to get the shuttles down.
Ta-Wei Wan
Bangkok, Thailand

Raid Over Moscow: Would you like more planes when attacking the last city before Moscow? When all your planes are out of the base, go into the empty base and pull your joystick up. In about seven seconds you'll hear an explosion and a refill of planes will appear. As you get those planes out, they'll form a filled-in ball that keeps growing when they mix with the planes from before.
Marc Miller
West Chester, PA

Revenge of the Nerds: Always remember that Nerds outnumber Jocks and Beautiful People and that Nerds are smarter and have purer hearts. Go easy when paddling pledges. Junk food will never kill you, but its energy is very short-lived.
Skip Sander
Durham, NC

Roadwar 2000: Visit San Jose/Mountain View and go to the SSI Company. When the secretary says "May I help you?" say yes. After some brief information, you can get a Doctor, Drill Ser-

geant and Politician. There's also a speed shop, welding shop, underbody shop and some others.
Ashton C. Hobbs
Reidsville, NC

Silent Service: Here's a way to "hyperspace" in your submarine. When attacking a convoy, approach it and attract the attention of the escorts. When they come after you, assume a course 180 degrees off that of the main body of the convoy. Maintain this course at a depth of about 200 feet, ensuring that the escorts don't give up the chase.

When you get the Low Battery signal, go to the maximum depth and evade the escorts. As soon as they give up the chase, go to the "continue patrol" map and move your marker two or three marker lengths in the direction of the convoy. Press fire/F1 to get back to the battle maps; the border will not turn red.

You'll find yourself close to the main body of the convoy, but the escorts will still be where you left them. Any damage you incurred will be repaired, and your torpedo tubes will be reloaded. Sink the unguarded convoy before the escorts can rejoin it.

When you get enough experience with submarine tactics, you can go back to playing by the rules.
Robert J. Stuck
Maryville, MO

Space Harrier: For infinite lives, load the game, reset the computer, then:

```
POKE 6010,234
POKE 6011,234
POKE 6012,234
SYS 2128
```

Adrian Zenker
Buenos Aires, Argentina

Spy vs. Spy series: I've noticed that in sword fights, the player to the left has a slight advantage. His attack is first and seems to be somewhat faster than the other player's.
Michael Kimsal
Mt. Clemens, MI

Street Sports Baseball: Put the strongest-armed players in the outfield. When the ball is hit to them, immediately throw to first base. As you'll see, many of the runners won't have a chance.
Fred DePaoli
Hammond, IN

Summer Games I: What's the easiest way to win a gold medal in Swimming? Cheat! Just false start all three times; if you're competing against another swimmer, you'll both get a gold and ten easy points.
Paul Jordan
Address Unknown

Super Bowl Sunday: With this offense, you can complete every pass and throw for over 700 yards per game: On the first screen, pick SHORT PASS "A." On the second, choose formation "2" 3-BACKS. On the third, use either quarterback, and when you come to the final menu pick any receiver except your running backs.

This defense will usually block field goal attempts: Use the 1 = RUN defense; then on the next screen use 1 = TOP OLB, 4 = BOTTOM OLB, while also using the short yardage defense 7 = 6 MAN LINE.
Fred DePaoli
Hammond, IN

Super Zaxxon: When the first heat-seeking missile appears, fly a collision course toward it, but pull up immediately before impact. If all goes well, you'll fly safely over the missile.
Cliff Wall
Mulberry, AR

Telengard: To build up characters, just stay in one place all the time. The safest place is at the exit. Monsters, gold and other items will appear at random, allowing you to gain experience points as you defeat the monsters.

For undead monsters like skeletons, mummies and ghouls, the spell "Turn Undead" will usually make them run.
J. T. Abernathy
Bend, OR

Ultima II: When you start a new character, head straight for a town and avoid all monsters on the way. Get armour and weapons first, then get food, but not spells, in a village. When you're low on points, talk to the king, who will give them to you for a tribute.

When you get enough gold, go to New San Antonio. In the Hotel California, offer the clerk money. If he says "Alakazam," he will raise a randomly selected attribute by four for every 100 given to him. Be careful—when any ability gets over 99 points, it flips and starts counting up again.

To get the quick sword, go to jail in New San Antonio and unlock the third cell on the left, offering the prisoner 500.

To find the ring, go to a sage and offer him 100, 200, 300 and so on up to 900. Write down the clues and read them all in order.
John Keller
Port St. Lucie, FL

Ultima III: In Castle Exodus, the order of the cards is Love, Sol, Moon and Death. You can find the cards by searching on the shrines in Ambrosia. To get to Ambrosia, take the whirlpool while sailing in a ship. Good Luck!
Nick Jeffords & Andy Welch
Whereabouts Unknown

Ultima IV: If you're an Avatar, ask Lady Tessa about mystical weapons and armour. If you dabble in the magical arts, two powerful spells are Resurrect and Gate Travel.

When traveling at sea, you will almost certainly need a sextant, which is item D at a Guild.

If you need to be healed but have no money, talk to Lord British, ask of his health, and answer his question in the negative.
Chris Swinehart
Bethesda, Maryland

Ultima IV: If you have a horse, yell "Giddy-up," and enter the whirlpool when it comes near the beach. You'll find yourself in the center of Lock Lake on a ship. When you exit the ship, your man will move at the speed of a horse!

You can enter the abyss without the wheel. Just exit your ship so the bombing from enemy ships will only hurt you and not your ship. You can stand many hits. The battles will be easy ones, and the ships left from the battles will serve you as a shield from the cannons of the other ships. After all the crews are dead, you can enter the island of the abyss.
Boaz Barak
Omer, Israel

Continued from page 81

as 15 characters per second, and even the middle range printers ($600-$1500) average only 70 cps. You won't see speed beyond 100 cps until you cross the $2000 price range.

However, if you want quality color printouts, ink jet printers are your ticket. The better printers can deliver seven different colored inks—magenta, cyan, yellow, red, blue, green and black (this is better than most commercial printing presses which handle only magenta, cyan and yellow inks). Because they spray ink, it is absorbed into the paper and will spread slightly. This spreading allows adjoining dots to merge, giving the impression of a solid image rather than a row of dots.

Laser Printers

The present sweetheart of all the printers is the laser. It is easy to fall in love with this one's beauty. Laser printers produce documents with letter-perfect text, and they reproduce graphics as well as any mechanical device. They are fast, quiet, flexible and unfortunately expensive. Their power and flexibility have made them synonymous with desktop publishing.

Unlike the other printers which work more or less like a typewriter (a typing head transfers the image to paper), lasers produce their images just like a photocopier. But the computer, instead of a printed page, supplies the image which must be produced. Once the printer has received the information from the computer, it electrically charges the surface of a revolving drum with a laser beam (thus the name). Printing toner (black powder) adheres to the areas of the drum which are charged and leaves the uncharged areas clean. Next the drum rotates and, using heat, transfers the toner to paper. Because a laser can pick smaller areas to charge than either matrix pins or jet nozzles, this printer can produce rows of dots as dense as 300 x 300 per inch.

To get an idea of how tight this pattern is, look at a black and white photograph in your local newspaper. These photos are routinely created using a matrix of dots which are no tighter than 100 x 100 per inch. Because the laser can create such a tight matrix pattern (nine times as tight), the final printouts compare well with those produced on professional typesetting machines costing many thousands of dollars more. This is why the laser is the preferred (if not required) printer for the desktop publishing industry.

Because the laser uses photocopier techniques, it is also the most quiet printer on the market and perfect for the office. And as if that weren't enough, they are fast too. Providing the software which transfers the data to the printer is efficient, a laser can turn out better than six pages a minute without breaking a sweat.

> Using an ink jet printer no longer means you'll be known as "old blue thumb."

Although laser printers seem to have it all, they may not be perfect for every project. For instance, most will handle paper no larger than legal size (8 1/2" x 14") in single sheets only, not continuous forms. And at this writing, they can't handle color images.

If your project requires the quality of a laser printer, be prepared to pay a hefty price to hook one to your system—they are not cheap. Like everyone else who mentions a laser printer, I feel obligated to add that their prices are coming down. But at this writing you can expect to pay a minimum of $1500 for the least expensive of these beautiful beasts with a brand name. (I have seen one ad for a Genicom brand printer in the $1000 range, but I can't speak for either its quality or construction.) That may sound like a lot of money for a printer, but when compared to $3000 for an entry-level laser just a few years ago, today's printers and prices are a bargain. I try to be optimistic when considering one of these printers for a possible addition to my own system. I keep reminding myself that the price has halved in the last few years, and hopefully (as supply, demand and competition increase) it will soon drop again. But at today's prices, it is hard (for me at least) to justify.

If you would like to see how good these printers can make your documents look, you might consider uploading a page or two to the GEOS Forum on Q-Link where it will be printed on their laser printer and mailed back to you. It will cost you a couple of dollars, but it lets you see what you can expect from a laser should you ever be able to afford one. Of course, the uploaded file must be created with one of the GEOS programs. (We all *do* have GEOS now, don't we?)

Failure to Communicate

To quote a famous line from an old movie (*Cool Hand Luke*), "What we have here is a failure to communicate" on a universal scale. The only people who haven't had printer problems are those who don't have printers. Without a doubt the most frustrating task for any computer owner is the chore of persuading a printer to respond to his or her computer's commands. Computers and printers are supposed to complement each other—like partners in a good marriage—where the husband and wife work together for common goals. But instead of complementing each other, computers and printers often seem to have been forged to do battle. Most of us who have tried to get these two to shake hands and work together have suspected that the developers of both computers and printers conspired to make sure the two could never peaceably coexist.

The reason it is so difficult to get most printers to understand and follow the commands issued by the computer is because no standard exchange code exists. Unfortunately, in the early days of computing few data exchange standards were established. While both sides of the developing industries agreed to use ASCII (American Standard Code for Information Interchange), no one agreed upon which codes would be used for what command codes. Thus while one printer may use ASCII code 78 to cause the printer to print pica-sized characters, another may use code 18 to do the same thing. When you multiply the number of makers of printers with the number of different possible combinations of character and command codes (0-255), you can begin to understand the difficulty you must overcome each time you try to hook a non-Commodore brand printer to your computer.

With no guarantee of results and the almost certain prospect of hand-shaking headaches, it's easy to understand why many users never venture far from the Commodore-compatible label. But there are good reasons to consider a non-Commodore specific printer: quality, features, speed, resale value and upgrading abilities to name a few. All that is required to unleash all that printing muscle is your computer, connected to the right printer via the right interface.

Printer Interface—The Tie That Binds

Some printers come factory wired to work with the 64 or 128. These are far and away the easiest to master. Just plug

the cable into the open port on the rear of your disk drive, and the two are married and live happily ever after. But most printers require you purchase a special cable (interface) which allows the computer and printer to connect. The interface serves as a translator for the printer. When the computer "speaks" through the wire the interface "listens" and then translates the commands into "language" (code) the printer understands.

At first glance the requirements of an interface may seem like a senseless complication of computing. Why not just buy a printer that already understands the computer's language? There are two reasons: (1) more selection and (2) flexibility. For instance, I own two printers and five Commodore computers. Neither of the printers are Commodore compatible. But by using interfaces, I can use the same printer with either my Amiga, 64 or 128. And because the printer end of all interfaces uses a universal design, I can plug all my computers into one switching box and select which one is online with a single switch.

But more importantly, using an interface lets me upgrade either printers or computers without having to change my entire system. With the right interface, you can connect any printer on the market with your 64 or 128, including the new laser printers.

To be honest, I've never connected a laser to either of my 64s or 128s. So, to be sure this was possible, I checked with Tony Hoover, a technical representative at Xetec. I figured if anyone knows about 64 and 128 interfaces it would be the people who make the popular Super Graphix interface. I expected him to tell me that they were working on a special laser-capable interface and maybe offer dates when it would be ready. But according to Tony, the faithful old Super Graphix itself will work with a laser—with no changes required. Hoover said it worked with an Okidata laser they were testing in transparent mode, the first time up and without a hitch.

Standards and Speed

While there are no universal standards for printers, there are some which because of their popularity have been emulated by many printer makers (similar to the way Hayes has become the quasi-standard for modem construction). Three of the more popular are Epson, Gemini and Prowriter. Because there are so many of these printers (or clones) in the working place, most software is designed to work with them.

Therefore, if the printer you are considering is capable of emulating one of these, you'll have no trouble getting an interface which will let you get to all its features—like pica, elite, expanded and condensed type sizes, underline and overstrike modes, superscript and subscript text and graphics.

> No two printers were created equal—speed, features, quality and cost differ greatly.

To get to these features you simply connect the interface and select transparent mode. This is done by switching a few tiny DIP (dual in-line package) switches. In transparent mode, the printer reproduces exactly what the computer program sends it—so if it receives an "E" it prints an "E" or if it gets a graphic symbol it prints that symbol—without trying to translate the code. In this mode any translation which needs to be done is handled by the software. This is a nice situation which works if the software supports your type of printer.

Unfortunately, all software does not support all printers. A second semi-standard printer type has surfaced which emulates Commodore's own 1525 printer. If this mode is selected, the printer is effectively turned into a model 1525 printer. This printer has been accepted as a standard because it was one of the first Commodore printers which handled both graphics and text and which the public bought in mass. Most software developers for the 64 and 128 whose products offer printouts support the 1525.

For these reasons, you will normally have fewer headaches if you select a printer or interface that either emulates one of the three non-Commodore standards or the 1525.

When selecting a printer, remember that the speed it is capable of attaining (as stated in the specifications) and the speed you witness may differ. Those lightning-sounding cps (characters per second) numbers almost always refer to the printer's fastest mode of printing which is "draft." In draft mode the display will be crude, since the head uses the fewest possible number of dots to finish the chore quickly. There is certainly nothing wrong with draft-quality documents, but for important correspondence you'll want to use the printer's overstrike mode so images are dark, solid and as professional looking as possible. When this is done, the print speed is usually halved. So a printer that is capable of 120 characters per second in draft mode may bog down to 60 cps (or less) in its better modes. So make sure you understand the claims of a printer before you buy. Normally, printers that are bi-directional (able to print both left to right and right to left) are faster regardless of the mode.

Handling the Paperwork

Another consideration when selecting a printer is its carriage size—that's the widest paper size it can handle. For most of us a standard width carriage is all that's required. If your work requires you to use paper wider than standard 8 1/2 inches, I suggest you use a utility program which allows your printer to print sideways (these are good for spreadsheets). Not only will a wide carriage printer cost you more, but the wider the paper, the more it costs as well.

Except for laser printers, all the other printer types can handle paper fed through as individual sheets or continuous forms. Unless you are sure all your printouts will be on continuous forms, try to test the printer's ability to handle single sheets of paper before buying. While almost all printers are designed to handle single sheets of paper, in actual use some handle the task better than others.

The budget-priced printer I have in my home-office can handle layers of single sheets with carbon paper just as easily as it handles continuous forms. On the other hand, the more expensive printer at my downtown office never feeds exactly right if more than one piece of carbon is used. As a result the forms sometimes shift slightly when advancing causing the printed lines to be uneven.

But the expensive printer has a feature which has endeared itself to me—it *pushes* continuous forms (its primary paper type) past the platen rather than *pulling* them. That may sound like a moot consideration, but in the workplace it is a feature worth considering. Depending upon the manufacturer, tractor units (the device which moves continuous form paper) may be located so they push or pull. Those which pull are located on the front where the form is printed. The assumed advantage of this location is that they are less likely to jam than those which pull,

Your Printer's Language

Codes Worth Knowing

Controlling a printer is not difficult providing you know how to communicate with it. Unfortunately, to learn the little beast's native tongue you must first decipher its user's manual. Only those who have tried to understand the instructions in one of those can sympathize with other users attempting the same task. At best, printer manuals are difficult for the novice and at worst they are as tough to understand as advanced calculus.

Here is an example of what you might encounter. These instructions are from the manual of my first NEC 8023 dot matrix printer:

(5) CAN (18)H
(a) This is the cancel code which cancels the line of print data received before receiving this code. (In the incremental mode, this code is ignored.)

If those instructions are clear to you, you are a better man than I am. The problem with many writers of printer manuals is they assume we all know both ASCII and HEX code, know the difference between 7-bit mode and n/144 and find that information interesting reading. In fact, most of us could not care less. All we want to do is get the metal marvel to do its tricks so we can move on to more enjoyable activities.

The first thing you must understand when using your 64 or 128 with a printer is that they communicate with the printer by sending ASCII coded messages. When the printer receives the message, it will try to either print the code's symbol or interpret it. To get most printers to use their more powerful features you must send two codes together.

The first is called an ESCAPE command and is usually shown in manuals as <ESC>. This command is actually the ASCII code #27 which is sent by most software as CHR$(27). After the printer receives an <ESC> command, it knows the next bit of information it will receive will change some of its internal switches.

For instance, on a Star printer the sequence CHR$(27);"4" tells the printer to switch to the italic character set. The CHR$(27) is the escape code followed by "4"—the same as ASCII 52/CHRS$(52). Depending upon what code the printer receives after the <ESC> command, the results will be different. On my NEC printer, the same command just prints the number "4"—nothing more.

To see what characters and symbols a Commodore-compatible printer would send to the printer, refer to your computer's user manual and the ASCII and CHR$ Codes Appendix. In some instances the same code will be used by other brand printers to achieve the same results, but not always.

As you can see, learning one printer's language doesn't necessarily mean you can talk with another. Having faced this dilemma myself I have devised two short programs which let me explore a new printer's language before putting it to work.

The two programs open a channel to the printer, then enter a counting loop which attempts to print every ASCII code between 0 and 255. Before you begin testing your printer, remember that some ASCII codes—usually those from CHR$(0) to CHR$(12)—are command codes which may print nothing on paper, cause your printer to freeze, cause it to do strange things (like spew out paper—the CHR$(12) is recognized by many printers as the code to execute a "top of form") or begin printing strange characters or symbols. If this happens, you can always abort

but because of their location they force you to waste one sheet of continuous form paper each time you start a job. So if you produce a lot of single-page documents, you may be able to halve your paper use by using a printer with a tractor feed which pushes (located behind the platen) forms instead of pulling. I use printers with both tractor feed types and have had no paper jams with either.

The Value of Buffers

None of us like to be placed on hold. But because it takes time for a printer to duplicate the signals it receives from your computer, the computer will put you on hold until it finishes its conversation with the printer. This is especially irritating when using a slow daisy wheel or ink jet printer. The simplest solution to this dilemma is the use of a buffer area where the code can be quickly dumped and held until the printer is ready to process it. Once all the data is moved to the buffer (usually taking only a second or two) control of the computer is returned to you so you can compute while the printer does its chore independently.

When only a few thousand signals (like a page of text) need to be dumped, you don't really need a buffer since the delays will be so brief they probably will go unnoticed. But when you begin to dump chunky documents, your system will shut down until the parallel port is cleared of the last bit of data.

The solution is a buffer (empty RAM) located either in the printer or interface which can quickly accept this overflow info and process it independently of the computer. The size of these buffer areas varies as much as brand names. A small buffer of 1K is helpful, but to achieve any real speed benefit look for printers or interfaces which offer buffers in the 8K to 10K (or larger) range. These buffers will cost a few extra dollars, but will quickly pay you back with the time they save.

Tomorrow

Like all the high tech tools developed in the past 20 years, printers are getting better, cheaper and more flexible each year. I bought my first quality matrix printer five years ago at $700, and I considered it a bargain. But the last one I bought retailed for less than $300, has a tighter matrix pattern, offers more features and is faster. It even uses ribbons which cost less than the first printer's. The same trend is true with interfaces. The first one I bought cost over $100 and had no special features at all (it could handle straight ASCII code—nothing else), but the two I use today will emulate over two dozen printers, allow the use of special fonts and will even translate symbols to ASCII. Plus these new, improved interfaces retailed for half what I paid for the old klinker.

What I'm trying to say is the future looks good. Quality is up and prices are down. Who knows, maybe one day soon they'll offer a super-fast, quiet, affordable printer that includes all the best features from all five types and can handle a rainbow of colors to boot.

Picking the right printer can be a difficult decision, and learning to speak and understand its language can be even more traumatic. But, once you own the right printer and know how to communicate with it, the three of you (you, your computer and printer) can settle into a happy relationship. There is nothing better than a good printer and nothing worse than a bad one. So take an old dad's good advice and shop around before you select the one you're going to settle down and spend the rest of your life with. C

the action and regain control by simply switching the printer off and then back on—this dumps the printer's buffer and resets its controls. Here's the first short program which tests your printer's code:

```
10 OPEN1,4
20 FOR X = 0 TO 255
30 PRINT#1,CHRS$(X)“ = ”X
40 NEXT X
50 PRINT#1
60 CLOSE1
```

The next program is just like the first, except the <ESC> command (the CHR$(27) in line 30) is sent before the actual tested ASCII code is sent.

```
10 OPEN1,4
20 FOR X = 0 TO 255
30 PRINT#1,CHR$(27); CHR$(X)“ =
   ”X
40 NEXT X
50 PRINT#1
60 CLOSE1
```

To benefit from the information the two programs can reveal, you must be willing to experiment a bit. For instance, if CHR$(20) switches text to condensed type, you can't be sure that the results of any following commands are accurate until the code to return the text to its normal pica size is sent. If the type style changes, or the printer locks up, you should press the RUN/STOP key, list the program and change the "0" in line 20 to the number following the offending code (in this case replace 0 with 21). Next switch your printer off (to reset all its internal switches), wait a second and then switch it back on. Now run the program with the changed loop numbers. Continue experimenting until you are sure what each ASCII code causes your printer to do. You might be surprised with some of the interesting features your printer has that you haven't been able to access. Keep the printout you get, and when you want to use that feature (underlining, superscript, foreign symbols, condensed, enlarged characters, etc.) just send it directly to the printer via your software, BASIC program or in direct mode.

For instance, if I want my NEC printer to print using the Greek alphabet, I can send this command in direct mode:

```
OPEN1,4: PRINT#1,CHRS$(27); “&”
<RETURN>
PRINT#1: CLOSE1 <RETURN>
```

From that command on, until I either cancel the mode by sending CHR$(36) or turn the printer off and back on again, every character sent to the printer will be translated into its Greek counterpart.

You cannot hurt your printer or computer testing with these programs. You can, however, waste some paper. If your printer ever runs out of paper, turn the printer off and don't run the program again until you have inserted more. Using any printer without paper can damage the printing head and the platen. If you spend the time required to experiment, you will probably learn more about your printer's features than you will ever learn trying to decipher the manual.

One More Note

For those who don't yet know how to list and print a disk's directory, here is the correct sequence of commands:

LOAD"$",8

(followed by RETURN loads the directory)

OPEN1,4:CMD1:LIST

(followed by RETURN, OPENs a channel to the printer and LISTs the directory on your printer)

PRINT#1:CLOSE1

(followed by RETURN, flushes the interface and closes the channel)

Continued from page 22

paste, invert, flip, rotate and merge to your heart's content. The rescaling feature is a boon to creativity allowing you to enlarge, reduce, squash or stretch on-screen images. *The Advanced Art Studio* adds the ability to load and save window files on disk. Use this function to store and manipulate individual portions of your finished work.

The Fill menu offers a choice of solid, textured and wash pattern fills. Each version presents the usual 16 primary colors for solid fills. The original disk, however, offers 32 patterns for textured and wash fills, nearly three times as many as the Advanced version.

Solid fills change selected areas (foreground or background) to the current ink color. Textured mode works in the same manner, but fills with plain or exotic patterns. Wash fills, on the other hand, do the opposite trick. This mode washes the results of the last operation with a selected pattern. A solid line or word, for example, could be washed with a striped or dotted pattern for an unusual effect. Finally, a pattern editor allows users to create their own textures.

A Magnify option offers block and pixel editing at magnifications of two, four or eight times normal. Users have full control of colors and image movement within this function.

The Text menu allows users to enter text horizontally or vertically in normal, double or triple height and width. Other features include boldface, caps, italics and complete control of pitch and line spacing. Several fonts are included in the Advanced version, although both disks contain full-featured font editors.

> You can define single or multiple windows, then rescale, clear, cut and paste, invert, flip, rotate and merge to your heart's content.

The Shapes menu offers point, single and continuous lines, triangle, circle, box and ray options. Most can also be set to elastic mode as a visual reference guide when drawing. An interesting option—available only on the original version—is called "snap." This automatically aligns the common side of two polygonal shapes, a feature rarely found in even the most advanced CAD programs.

Finally, the Print menu features a multitude of hard copy options. The *OCP Art Studio* offers single or double density screen dumps ranging in scale from 1x1 to 5x5. Another option uses stippling to create an effective gray-scale dump of a multi-colored picture. Pictures may be centered, justified to the right or left, and even printed sideways. The *Advanced Art Studio* contains all the above features, as well as improved X-Y scaling—up to an amazing 6x16 picture dump.

In addition to all of these extraordinary features, both disks share one serious flaw: a painfully cryptic printer set-up program. Rather than including most common printer drivers, the designers placed this burden on the unwilling backs of the consumer. Luckily, Rainbird's Customer Service department is very helpful for those unfamiliar with escape codes and obscure printer commands.

The Advanced OCP Art Studio, in both its incarnations, represents an incredible leap forward in the area of creative, computer-aided design. One look and you'll never take your 64's graphic capabilities for granted again.

COMPUTER DIRECT

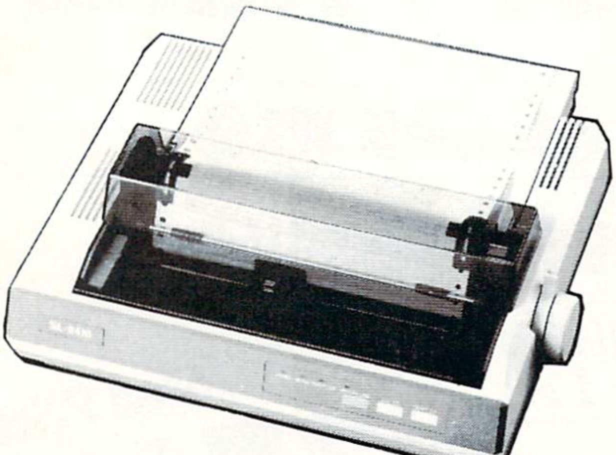
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- IBM & Epson Mode
- Adjustable Sprocket Feed & Friction Feed
- Parallel Centronics Port

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SPECIFICATIONS

Print Buffer
32K

Printing Method
Serial Impact Dot Matrix

Printing Speed
135 CPS in Draft Pica Mode
45 CPS in Letter Quality Pica Mode

Printing Direction
Bi-Directional, Logical Seeking For Text
Uni-Directional, Left to Right For Graphics

Pin Configuration
24 Wires (12 x 2 staggered, diameter 0.2 mm)

Paper Feed
Adjustable Sprocket Feed & Friction Feed
Auto Loading

Dot Resolution
Horizontal - 60, 80, 90,
120, 180, 240, 360 dot/in.
Vertical - 60, 180 dot/in.

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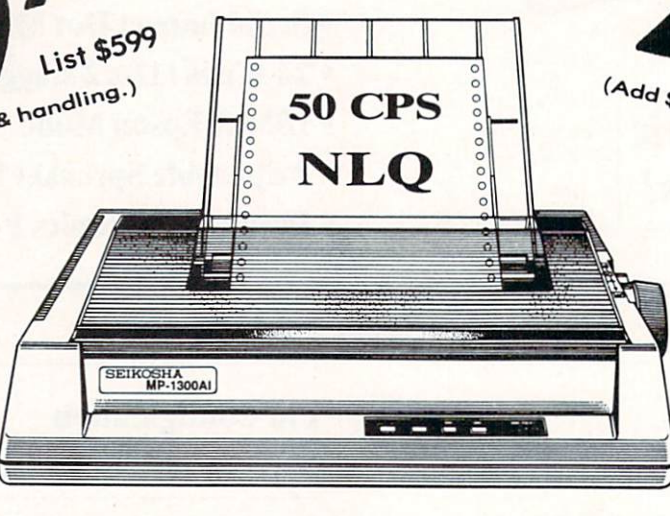
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Print Method
Impact Dot Matrix
Print Speed
Draft- 300 CPS NLQ- 50 CPS
Character Sets
185 Characters Kinds, 8 International Fonts, 256 Download Characters

Dimensions
18.5 (W) x 14.1 (D) x 5.5 (H) inch
Weight
Approx. 19 lbs
Printing Direction
Bi-directional
Ribbon (Life exp.)
Black: cassette (8 million characters)

Line Spacing
7/72", 1/8", 1/6", n/216", n/144", n/72"
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Adjustable tractor and friction feed
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The programs which appear in this magazine have been run, tested and checked for bugs and errors. After a program is tested, it is printed on a letter quality printer with some formatting changes. This listing is then photographed directly and printed in the magazine. Using this method ensures the most error-free program listings possible.

Whenever you see a word inside brackets, such as [DOWN], the word represents a keystroke or series of keystrokes on the keyboard. The word [DOWN] would be entered by pressing the cursor-down key. If multiple keystrokes are required, the number will directly follow the word. For example, [DOWN4] would mean to press the cursor-down key four times. If there are multiple words within one set of brackets, enter the keystrokes directly after one another. For example, [DOWN, RIGHT2] would mean to press the cursor-down key once and then the cursor-right key twice. Note: Do not enter the commas.

In addition to these graphic symbols, the keyboard graphics are all represented by a word and a letter. The word is either SHFT or CMD and represents the SHIFT key or the Commodore key. The letter is one of the letters on the keyboard. The combination [SHFT E] would be entered by holding down the SHIFT key and pressing the E. A number following the letter tells you how many times to type the letter. For example, [SHFT A4,CMD B3] would mean to hold the SHIFT key and press the A four times, then hold down the Commodore key and press the B three times.

The following chart tells you the keys to press for any word or words inside of brackets. Refer to this chart whenever you aren't sure what keys to press. The little graphic next to the keystrokes shows you what you will see on the screen.

SYNTAX ERROR

This is by far the most common error encountered while entering a program. Usually (sorry folks) this means that you have typed something incorrectly on the line the syntax error refers to. If you get the message "?Syntax Error Break In Line 270", type LIST 270 and press RETURN. This will list line 270 to the screen. Look for any non-obvious mistakes like a zero in place of an O or vice-versa. Check for semicolons and colons reversed and extra or missing parenthesis. All of these things will cause a syntax error.

There is only one time a syntax error will tell you the "wrong" line to look at. If the line the syntax error refers to has a function call (i.e., FN A(3)), the syntax error may be in the line that defines the function, rather than the line named in the error message. Look for a line near the beginning of the program (usually) that has DEF FN A(X) in it with an equation following it. Look for a typo in the equation part of this definition.

ILLEGAL QUANTITY ERROR

This is another common error message. This can also be caused by a typing error, but it is a little harder to find. Once again, list the line number that the error message refers to. There is probably a poke statement on this line. If there is, then the error is referring to what is trying to be poked. A number must be in the range of zero to 255 to be poke-able. For example, the statement POKE 1024,260 would produce an illegal quantity error because 260 is greater than 255.

Most often, the value being poked is a variable (A,X...). This error is telling you that this variable is out of range. If the variable is being read from data statements, then the problem is somewhere in the data statements. Check the data statements for missing commas or other typos.

If the variable is not coming from data statements, then the problem will be a little harder to find. Check each line that contains the variable for typing mistakes.

OUT OF DATA ERROR

This error message is always related to the data statements in a program. If this error occurs, it means that the program has run out of data items before it was supposed to. It is usually caused by a problem or typo in the data statements. Check first to see if you have left out a whole line of data. Next, check for missing commas between numbers. Reading data from a page of a magazine can be a strain on the brain, so use a ruler or a piece of paper or anything else to help you keep track of where you are as you enter the data.

OTHER PROBLEMS

It is important to remember that the 64 and the PET/CBM computers will only accept a line up to 80 characters long. The VIC 20 will accept a line up to 88 characters long. Sometimes you will find a line in a program that runs over this number of characters. This is not a mistake in the listing. Sometimes programmers get so carried away crunching programs that they use abbreviated commands to get more than 80 (or 88) characters on one line. You can enter these lines by abbreviating the commands when you enter the line. The abbreviations for BASIC commands are on pages 133-134 of the VIC 20 user guide and 130-131 of the Commodore 64 user's guide.

If you type a line that is longer than 80 (or 88) characters, the computer will act as if everything is ok, until you press RETURN. Then, a syntax error will be displayed (without a line number). Many people write that the computer gives them a syntax error when they type the line, or that the computer refuses to accept a line. Both of these problems are results of typing a line of more than 80 (or 88) characters.

"[HOME]" = UNSHIFTED CLR/ HOME
"[CLEAR]" = SHIFTED CLR/HOME
"[DOWN]" = CURSOR DOWN
"[UP]" = CURSOR UP
"[RIGHT]" = CURSOR RIGHT
"[LEFT]" = CURSOR LEFT
"[RVS]" = CONTROL 9
"[RVOFF]" = CONTROL 0
"[BLACK]" = CONTROL 1
"[WHITE]" = CONTROL 2
"[RED]" = CONTROL 3
"[CYAN]" = CONTROL 4
"[PURPLE]" = CONTROL 5
"[GREEN]" = CONTROL 6
"[BLUE]" = CONTROL 7
"[YELLOW]" = CONTROL 8
"[ORANGE]" = COMMODORE 1
"[BROWN]" = COMMODORE 2
"[L. RED]" = COMMODORE 3
"[GRAY1]" = COMMODORE 4
"[GRAY2]" = COMMODORE 5
"[L. GREEN]" = COMMODORE 6
"[L. BLUE]" = COMMODORE 7
"[GRAY3]" = COMMODORE 8
"[F1]" = F1
"[F2]" = F2
"[F3]" = F3
"[F4]" = F4
"[F5]" = F5
"[F6]" = F6
"[F7]" = F7
"[F8]" = F8
"[POUND]" = ENGLISH POUND
"[SHFT ^]" = PI SYMBOL
"[^]" = UP ARROW

GRAPHIC SYMBOLS WILL BE REPRESENTED AS EITHER THE LETTERS SHFT (SHIFT) AND A KEY ("[SHFT Q,SHFT J,SHFT D,SHFT S]") OR THE LETTERS CMDR (COMMODORE) AND A KEY ("[CMDR Q,CMDR G,COMDR Y,CMDR H]"). IF A SYMBOL IS REPEATED, THE NUMBER OF REPITITIONS WILL BE DIRECTLY AFTER THE KEY AND BEFORE THE COMMA ("[SPACE3,SHFT S4,CMDR M2]").

THE PROGRAM WON'T RUN!!

This is the hardest of problems to resolve; no error message is displayed, but the program just doesn't run. This can be caused by many small mistakes typing a program in. First check that the program was written for the computer you are using. Check to see if you have left out any lines of the program. Check each line of the program for typos or missing parts. Finally, press the RUN/STOP key while the program is "running". Write down the line the program broke at and try to follow the program backwards from this point, looking for problems.

IF ALL ELSE FAILS

You've come to the end of your rope. You can't get the program to run and you can't find any errors in your typing. What do you do? As always, we suggest that you try a local user group for help. In a group of even just a dozen members, someone is bound to have typed in the same program. The user group may also have the program on a library disk and be willing to make a copy for you.

If you do get a working copy, be sure to compare it to your own version so that you can learn from your errors and increase you understanding of programming.

If you live in the country, don't have a local user group, or you simply can't get any help, write to us. If you do write to us, include the following information about the program you are having problems with:

The name of the program
The issue of the magazine it was in
The computer you are using
Any error messages and the line numbers
Anything displayed on the screen
A printout of your listing (if possible)

All of this information is helpful in answering your questions about why a program doesn't work. A letter that simply states "I get an error in line 250 whenever I run the program" doesn't give us much to go on. Send your questions to:

Commodore Magazine
1200 Wilson Drive
West Chester, PA 19380
ATTN: Program Problem

Have fun with the programs! ▣

HOW TO USE THE MAGAZINE ENTRY PROGRAMS

The Magazine Entry Programs on the next pages are two BASIC machine language programs that will assist you in entering the programs in this magazine correctly. There are versions for both the Commodore 64 and the Commodore 128. Once the program is in place, it works its magic without you having to do anything else. The program will not let you enter a line if there is a typing mistake on it, and better yet, it identifies the kind of error for you.

Getting Started

Type in the Magazine Entry Program carefully and save it as you go along (just in case). Once the whole program is typed in, save it again on tape or disk. Now RUN the program. The word POKING will appear on the top of the screen with a number. The number will increment from 49152 up to 49900 (4864-5545 on the 128) and just lets you know that the program is running. If everything is ok, the program will finish running and say DONE. Then type NEW. If there is a problem with the data statements, the program will tell you where to find the problem. Otherwise the program will say "mistake in data statements." Check to see if commas are missing, or if you have used periods instead of commas. Also check the individual data items.

Once the program has run, it is in memory ready to go. To activate the program type SYS49152 (SYS4864 on the 128), and press RETURN. You are now ready to enter the programs from the magazine. To disable the Entry Program, just type KILL [RETURN] on the 64 or SYS4867 on the 128.

The checksums for each line are the same for both the 64 and 128, so you can enter your 64 programs on the 128 if you'd like.

Typing the Programs

All the BASIC program listings in this magazine that are for the 64 or 128 have an apostrophe followed by four letters at the end of the line (e.g., 'ACDF). If you plan to use the Magazine Entry Program to enter your programs, the apostrophe and letters **should** be entered along with the rest of the line. This is a checksum that the Magazine Entry Program uses.

Enter the line and the letters at the end and then press RETURN, just as you normally would.

If the line is entered correctly, a bell is sounded and the line is entered into the computer's memory (without the characters at the end).

If a mistake was made while entering the line, a noise is sounded and an error message is displayed. Read the error message, then press any key to erase the message and correct the line.

IMPORTANT

If the Magazine Entry Program sees a mistake on a line, it **does not** enter that line into memory. This makes it impossible to enter a line incorrectly.

Error Messages and What They Mean

There are five error messages that the Magazine Entry Program uses. Here they are, along with what they mean and how to fix them.

NO CHECKSUM: This means that you forgot to enter the apostrophe and the four letters at the end of the line. Move the cursor to the end of the line you just typed and enter the checksum.

QUOTE: This means that you forgot (or added) a quote mark somewhere in the line. Check the line in the magazine and correct the quote.

KEYWORD: This means that you have either forgotten a command or spelled one of the BASIC keywords (GOTO, PRINT. .) incorrectly. Check the line in the magazine again and check your spelling.

OF CHARACTERS: This means that you have either entered extra characters or missed some characters. Check the line in the magazine again. This error message will also occur if you misspell a BASIC command, but create another keyword in doing so. For example, if you misspell PRINT as PRONT, the 64 sees the letter P and R, the BASIC keyword ON and then the letter T. Because it sees the keyword ON, it thinks you've got too many characters, instead of a simple misspelling. Check spelling of BASIC commands if you can't find anything else wrong.

UNIDENTIFIED: This means that you have either made a simple spelling error, you typed the wrong line number, or you typed the checksum incorrectly. Spelling errors could be the wrong number of spaces inside quotes, a variable spelled wrong, or a word misspelled. Check the line in the magazine again and correct the mistake. ▣

The Magazine Entry Programs are available on disk, along with other programs in this magazine, for $9.95. To order, contact Loadstar at 1-800-831-2694.

```
10 PRINT"[CLEAR]POKING -";
20 P=49152 :REM $C000  (END AT
   49900/$C2EC)
30 READ A$:IF A$="END"THEN 110
40 L=ASC(MID$(A$,2,1))
50 H=ASC(MID$(A$,1,1))
60 L=L-48:IF L>9 THEN L=L-7
70 H=H-48:IF H>9 THEN H=H-7
80 PRINT"[HOME,RIGHT12]"P;
90 IF H>15 OR L>15 THEN PRINT
   :PRINT"DATA ERROR IN LINE";
   1000+INT((P-49152)/8):STOP
100 B=H*16+L:POKE P,B:T=T+B:P=P+1
    :GOTO 30
110 IF T<>86200 THEN PRINT
    :PRINT"MISTAKE IN DATA --> CHECK
    DATA STATEMENTS":END
120 PRINT"DONE":END
1000 DATA 4C,1F,C0,00,00,00,00,00
1001 DATA 00,00,00,00,00,0D,00,21
1002 DATA C1,27,C1,2F,C1,3F,C1,4C
1003 DATA C1,EA,EA,EA,4C,54,C0,A2
1004 DATA 05,BD,19,C0,95,73,CA,10
1005 DATA F8,60,60,A0,03,B9,00,02
1006 DATA D9,04,C1,D0,F5,88,10,F5
1007 DATA A0,05,B9,A2,E3,99,73,00
1008 DATA 88,10,F7,A9,00,8D,18,D4
1009 DATA 4C,EF,C0,E6,7A,D0,02,E6
1010 DATA 7B,4C,79,00,A5,9D,F0,F3
1011 DATA A5,7A,C9,FF,D0,ED,A5,7B
1012 DATA C9,01,D0,E7,20,2B,C0,AD
1013 DATA 00,02,20,74,C0,90,DC,A0
1014 DATA 00,4C,A9,C1,C9,30,30,06
1015 DATA C9,3A,10,02,38,60,18,60
1016 DATA C8,B1,7A,C9,20,D0,03,C8
1017 DATA D0,F7,B1,7A,60,18,C8,B1
1018 DATA 7A,F0,37,C9,22,F0,F5,6D
1019 DATA 03,C0,8D,03,C0,AD,04,C0
1020 DATA 69,00,8D,04,C0,4C,8E,C0
1021 DATA 18,6D,05,C0,8D,05,C0,90
1022 DATA 03,EE,06,C0,EE,09,C0,4C
1023 DATA CE,C1,18,6D,08,C0,8D,08
1024 DATA C0,90,03,EE,07,C0,EE,0A
1025 DATA C0,60,0A,A8,B9,0F,C0,85
1026 DATA FB,B9,10,C0,85,FC,A0,00
1027 DATA A9,12,20,D2,FF,B1,FB,F0
1028 DATA 06,20,D2,FF,C8,D0,F6,20
1029 DATA BC,C2,20,E4,FF,F0,FB,A0
1030 DATA 18,B9,08,C1,20,D2,FF,88
1031 DATA 10,F7,68,68,A9,00,8D,00
1032 DATA 02,4C,74,A4,4B,49,4C,4C
1033 DATA 91,91,0D,20,20,20,20,20
1034 DATA 20,20,20,20,20,20,20,20
1035 DATA 20,20,20,20,20,20,20,91
1036 DATA 0D,51,55,4F,54,45,00,4B
1037 DATA 45,59,57,4F,52,44,00,23
1038 DATA 20,4F,46,20,43,48,41,52
1039 DATA 41,43,54,45,52,53,00,55
1040 DATA 4E,49,44,45,4E,54,49,46
1041 DATA 49,45,44,00,4E,4F,20,43
1042 DATA 48,45,43,4B,53,55,4D,00
1043 DATA C8,B1,7A,D0,FB,84,FD,C0
1044 DATA 09,10,03,4C,84,C1,88,88
1045 DATA 88,88,88,B1,7A,C9,27,D0
1046 DATA 13,A9,00,91,7A,C8,A2,00
1047 DATA B1,7A,9D,3C,03,C8,E8,E0
1048 DATA 04,D0,F5,60,A9,04,4C,CA
1049 DATA C0,A0,00,B9,00,02,99,40
1050 DATA 03,F0,F0,C8,D0,F5,A0,00
1051 DATA B9,40,03,F0,E6,99,00,02
1052 DATA C8,D0,F5,20,96,C1,4C,12
1053 DATA C2,A0,09,A9,00,99,03,C0
1054 DATA 8D,3C,03,88,10,F7,A9,80
1055 DATA 85,02,A0,00,20,58,C1,20
1056 DATA 89,C1,20,ED,C1,E6,7A,E6
1057 DATA 7B,20,7C,A5,A0,00,20,80
1058 DATA C0,F0,D0,24,02,F0,06,4C
1059 DATA A8,C0,4C,CE,C1,C9,22,D0
1060 DATA 06,20,8D,C0,4C,CE,C1,20
1061 DATA BA,C0,4C,CE,C1,A0,00,B9
1062 DATA 00,02,20,74,C0,C8,90,0A
1063 DATA 18,6D,07,C0,8D,07,C0,4C
1064 DATA EF,C1,88,A2,00,B9,00,02
1065 DATA 9D,00,02,F0,04,E8,C8,D0
1066 DATA F4,60,18,AD,09,C0,69,41
1067 DATA 8D,09,C0,38,AD,0A,C0,E9
1068 DATA 19,90,06,8D,0A,C0,4C,1C
1069 DATA C2,AD,0A,C0,69,41,8D,0A
1070 DATA C0,AD,03,C0,6D,05,C0,48
1071 DATA AD,04,C0,6D,06,C0,8D,0C
1072 DATA C0,68,6D,08,C0,8D,0B,C0
1073 DATA AD,0C,C0,6D,07,C0,8D,0C
1074 DATA C0,38,E9,19,90,06,8D,0C
1075 DATA C0,4C,52,C2,AD,0C,C0,69
1076 DATA 41,8D,0C,C0,AD,0B,C0,E9
1077 DATA 19,90,06,8D,0B,C0,4C,67
1078 DATA C2,AD,0B,C0,69,41,8D,0B
1079 DATA C0,A0,01,AD,09,C0,CD,3C
1080 DATA 03,D0,20,C8,AD,0A,C0,CD
1081 DATA 3D,03,D0,17,C8,AD,0B,C0
1082 DATA CD,3E,03,D0,0E,AD,0C,C0
1083 DATA CD,3F,03,D0,06,20,CC,C2
1084 DATA 4C,4B,C0,98,48,68,4C,CA
1085 DATA C0,A9,20,8D,00,D4,8D,01
1086 DATA D4,A9,09,8D,05,D4,A9,0F
1087 DATA 8D,18,D4,60,20,A9,C2,A9
1088 DATA 81,20,DF,C2,A9,80,20,DF
1089 DATA C2,4C,D9,C2,20,A9,C2,A9
1090 DATA 11,20,DF,C2,A9,10,20,DF
1091 DATA C2,A9,00,8D,04,D4,60,8D
1092 DATA 04,D4,A2,70,A0,00,88,D0
1093 DATA FD,CA,D0,FA,60,END
```

END

```
5 TRAP 200
10 PRINT"[CLEAR]POKING -";
20 P=4864 :REM $1300  (END AT
   5545/$15A9)
30 READ A$:IF A$="END"THEN 110
80 PRINT"[HOME,RIGHT12]"P;
100 B=DEC(A$):POKE P,B:T=T+B:P=P+1
    :GOTO 30
110 IF T<>59382 THEN PRINT
    :PRINT"MISTAKE IN DATA --> CHECK
    DATA STATEMENTS":END
120 PRINT"DONE":END
200 PRINT:PRINT"DATA ERROR IN LINE";
    1000+INT((P-4864)/8):END
1000 DATA 4C,1E,13,4C,3A,13,00,00
1001 DATA 8E,00,F7,00,42,41,51,57
1002 DATA 0D,00,0D,43,08,14,0E,14
1003 DATA 16,14,26,14,33,14,A9,00
1004 DATA 8D,00,FF,AD,04,03,8D,12
1005 DATA 13,AD,05,03,8D,13,13,A2
1006 DATA 4A,A0,13,8E,04,03,8C,05
1007 DATA 03,60,AD,12,13,8D,04,03
1008 DATA AD,13,13,8D,05,03,60,6C
1009 DATA 12,13,A5,7F,D0,F9,AD,00
1010 DATA 02,20,5B,13,90,F1,A0,00
1011 DATA 4C,6F,14,C9,30,30,06,C9
1012 DATA 3A,10,02,38,60,18,60,C8
1013 DATA B1,3D,C9,20,D0,03,C8,D0
1014 DATA F7,B1,3D,60,18,C8,B1,3D
1015 DATA F0,35,C9,22,F0,F5,6D,06
1016 DATA 13,8D,06,13,AD,07,13,69
1017 DATA 00,8D,07,13,4C,75,13,18
1018 DATA 6D,08,13,8D,08,13,90,03
1019 DATA EE,09,13,EE,0C,13,60,18
1020 DATA 6D,0B,13,8D,0B,13,90,03
1021 DATA EE,0A,13,EE,0D,13,60,0A
1022 DATA A8,B9,14,13,85,FB,B9,15
1023 DATA 13,85,FC,A0,00,8C,00,FF
1024 DATA A9,12,20,D2,FF,B1,FB,F0
1025 DATA 06,20,D2,FF,C8,D0,F6,20
1026 DATA 79,15,20,A3,15,20,E4,FF
1027 DATA F0,FB,A0,1B,B9,EF,13,20
1028 DATA D2,FF,88,10,F7,68,68,A9
1029 DATA 00,8D,00,02,4C,B7,4D,91
1030 DATA 91,0D,20,20,20,20,20,20
1031 DATA 20,20,20,20,20,20,20,20
1032 DATA 20,20,20,20,20,20,91,0D
1033 DATA 51,55,4F,54,45,00,4B,45
1034 DATA 59,57,4F,52,44,00,23,20
1035 DATA 4F,46,20,43,48,41,52,41
1036 DATA 43,54,45,52,53,00,55,4E
1037 DATA 49,44,45,4E,54,49,46,49
1038 DATA 45,44,00,4E,4F,20,43,48
1039 DATA 45,43,4B,53,55,4D,00,C8
1040 DATA B1,3D,D0,FB,98,30,04,C9
1041 DATA 06,30,1E,88,88,88,88,88
1042 DATA B1,3D,C9,27,D0,13,A9,00
1043 DATA 91,3D,C8,A2,00,B1,3D,9D
1044 DATA 00,0B,C8,E8,E0,04,D0,F5
1045 DATA 60,4C,5C,15,4C,C5,14,A0
1046 DATA 09,A9,00,99,06,13,8D,00
1047 DATA 0B,88,10,F7,A9,80,85,FD
1048 DATA A0,00,20,3F,14,20,AE,14
1049 DATA 20,0D,43,84,FA,A0,FF,20
1050 DATA 67,13,F0,D8,24,FD,F0,06
1051 DATA 20,8F,13,4C,8F,14,C9,22
1052 DATA D0,06,20,74,13,4C,8F,14
1053 DATA 20,9F,13,4C,8F,14,A0,00
1054 DATA B9,00,02,20,5B,13,C8,90
1055 DATA 0A,18,6D,0A,13,8D,0A,13
1056 DATA 4C,B0,14,88,60,18,AD,0C
1057 DATA 13,69,41,8D,0C,13,38,AD
1058 DATA 0D,13,E9,19,90,06,8D,0D
1059 DATA 13,4C,CF,14,AD,0D,13,69
1060 DATA 41,8D,0D,13,AD,06,13,6D
1061 DATA 08,13,48,AD,07,13,6D,09
1062 DATA 13,8D,0F,13,68,6D,0B,13
1063 DATA 8D,0E,13,AD,0F,13,6D,0A
1064 DATA 13,8D,0F,13,38,E9,19,90
1065 DATA 06,8D,0F,13,4C,05,15,AD
1066 DATA 0F,13,69,41,8D,0F,13,AD
1067 DATA 0E,13,E9,19,90,06,8D,0E
1068 DATA 13,4C,1A,15,AD,0E,13,69
1069 DATA 41,8D,0E,13,A0,01,AD,0C
1070 DATA 13,CD,00,0B,D0,20,C8,AD
1071 DATA 0D,13,CD,01,0B,D0,17,C8
1072 DATA AD,0E,13,CD,02,0B,D0,0E
1073 DATA AD,0F,13,CD,03,0B,D0,06
1074 DATA 20,89,15,A4,FA,60,98,48
1075 DATA 68,4C,AF,13,A9,04,4C,AF
1076 DATA 13,A9,00,8D,00,FF,A9,20
1077 DATA 8D,00,D4,8D,01,D4,A9,09
1078 DATA 8D,05,D4,A9,0F,8D,18,D4
1079 DATA 60,20,61,15,A9,81,20,9C
1080 DATA 15,A9,80,20,9C,15,4C,96
1081 DATA 15,20,61,15,A9,11,20,9C
1082 DATA 15,A9,10,20,9C,15,A9,00
1083 DATA 8D,04,D4,60,8D,04,D4,A2
1084 DATA 70,A0,00,88,D0,FD,CA,D0
1085 DATA FA,60,END
```

END

Continued from page 16

If you are constantly cleaning the face of your monitor, no matter which brand, I strongly suggest that you use nothing stronger than a mild soap and water (no ammonia) solution to remove the dust and finger prints.
James Arkwright
Phoenix, AZ

*[**Editor's Note:** Commodore recommends that you **do not** use alcohol or ammonia based products or any spray cleaner on your monitor screen. To clean the screen, unplug the monitor and wipe with a slightly damp cloth.]*

A Clean Mouse is a Happy Mouse: I purchased my Amiga 500 a little over three months ago and about a week ago, I noticed that my mouse was acting very erratically. Sometimes the pointer wouldn't move at all, and then it would jump a cross the screen in a strange manner.

I figured that there was a hardware problem, so I packed my system up and headed down to my Amiga dealer for a little R&R (Return and Repair). The store's technician took the 500 out by itself and hooked up his mouse. Voila! The erratic pointer had disappeared! He then took my mouse out and opened the bottom and dropped the little rubber ball out. He then showed me "the dirtiest set of rollers" that he had ever seen and proceeded to teach me about dirty desktops and how Amiga mice were allergic to such things.

The gist of the lecture was: if you don't use a mouse pad, ensure that the mouse's operation area is kept free of dirt, drink spills, crumbs and other nasty things that tend to gum up the mouse's ball and then transfer themselves onto the rollers inside.

I ended up having to replace my mouse because he couldn't get the grunge off the rollers. Not a suggested fix when the preventative measures are so simple. Hopefully this will help keep others from ending up in this same situation.
Paul Jyung
Aiea, Oahu, HI

Amiga 500 Monitor Support: When I bought my Amiga 500, I neglected to take into mind just where I would place my monitor on my 26" x 48" desk. I was replacing an old MS-DOS clone which allowed the monitor to sit on top and just didn't think that I wouldn't be able to do the same thing with my new Amiga.

Well, when I got the system home and took the 500 out of its box and placed it on the desk, my problem became quite apparent. I called my dealer and asked if he had any suggestions. He said that he had heard that the new 2002 monitor had two small feet on the rear that would act as supports for the rear of the monitor so you could rest the front of the monitor on top of the Amiga 500. I looked and sure enough, there they were. The only problem was that they appeared to be too short in my case.

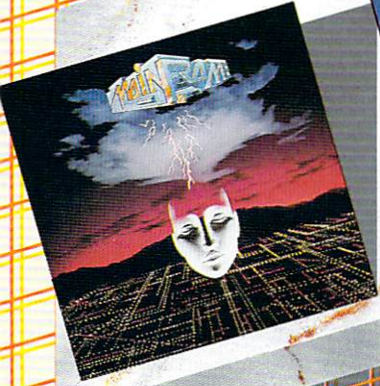
I started searching around the house and found my three-year-old's Playschool(tm) building blocks (those colorful little ones that come in the big drum and are always under foot). It looked like the space between the bottom of the 2002's legs and the desktop were about the thickness of one of these blocks laid flat. I grabbed a couple of the blue ones while he wasn't looking and lo and behold, they worked.

Now, my Amiga and its monitor both sit securely on top of my small desk. At least as long as my son doesn't see his blocks . . .
Jerry Marks
Portland, OR

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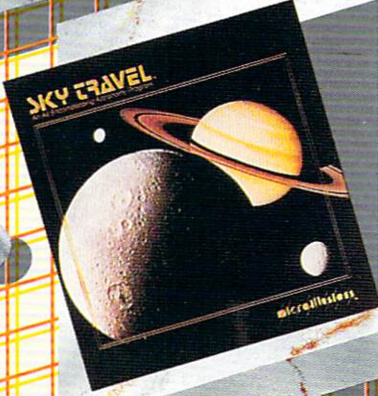


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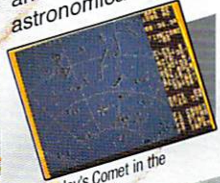

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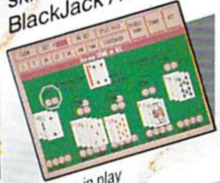

Haley's Comet in the southern sky

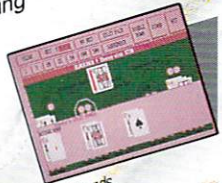

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